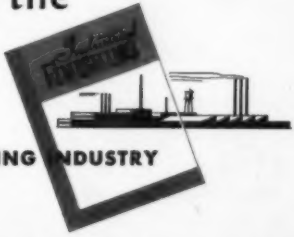
Industrial FINISHING

Time reveals the character of a publication and its value to the industries it serves.



TWENTY-FIVE YEARS OF SERVICE TO THE FINISHING INDUSTRY

IT'S COMPACT
...fits in a desk drawer!
IT'S LIGHT AND PORTABLE
...goes everywhere with the traveling executive!
IT'S BEAUTIFIED AND PROTECTED
...by an INTERCHEM FINISH!

For its new, portable "Time-Master," Dictaphone selects....

A MAR-RESISTANT FINISH THAT SPEAKS FOR ITSELF

Design a portable dictating machine for the businessman on the go and you have to finish it with an extremely tough, mar-resistant, abrasion-resistant finish... one that will speak well for itself and for the product after that product has had years of hard use in the office and has also traveled hundreds, perhaps thousands, of miles under Pullman berths, in airplane luggage compartments, and in the back of a car.

For finishing just such a machine... the new, "personal" Dictaphone "Time-Master"... Dictaphone engineers are using Interchem Finishes. You can depend on it that the knowledge and experience which formulated these extremely tough, mar-resistant, abrasion-resistant finishes for Dictaphone Corporation can engineer finishes of lasting beauty for your product.

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Industrial FINISHING

W. H. ROHR, Editor P. C. BARDIN, Associate Editor

Contents

Random Comment on the Industrial Scene	4
Industrial Finishing's Twenty-Fifth Anniversary	28
25 Years of Industrial Paint Progress	30
Progress in Modern Finishing Equipment	48
Finishing Materials, 1923-1948	58
A Quarter of a Century of Production Finishing	66
Electrostatic Spraying	71
Finishing Halliburton Aluminum Travel Cases	78
Painting Products in a Custom Shop	92
Setup for Surface-Treating and Painting Black Auto Horns	104
Some Causes of Spotting in Wood Finishing	112
Letters from Readers	120
Questions and Answers	126
Materials; Supplies; Equipment	132
Speaking with Authority for the Finishing Industry	144
Booklets; Circulars; Catalogs	158
Editorial	162
"Classified Advertising" Section	174
Advertisers Index	176

Finishing Shares Spotlight at Metals Show	76
High Solids in Wood Lacquer Sealers	90
Mixing Equipment Announces New Representative	110
DuPont Chemicals Exhibited	118
Lilly Paint Products Opens Warehouse in Dallas	118
Chemco Products Moves	130
Materials Handling Show	130
Tousey Installs Ten New Underground Storage Tanks	142
Burruss Honored by Glidden Co.	148
Hilo Appoints Sales Representatives	150
Fay Appointed General Mgr. of Robertson Co.	150
Hogstrom Becomes Supt. of Stille-Young Plant	150
Atlas Industrial Finishes Promotes Three Executives	152
Basic Flameproof Patents Now Available to Industry	157
Customer Service Department Announced by Binks	173

OVEMBER, 1948
Vol. XXV, No. 1

buted monthly to finishing and paint shop foremen, ction superintendents, sts, purchasing agents and ny executives of metal-ng, woodworking and mis-ceous industrial plants production cleaning and g are major operations in and products manufactur-

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25 TWENTY-FIFTH YEAR OF PUBLICATION

Free Enterprise. The free enterprise system has lifted us, in terms of material things, to a position far higher than any other nation in the world, not because we have more coal or more gold or more land, but because we have more incentive, more venture, more determination.

Everyone who saves and is thrifty is a capitalist. Most people who work save, so that by and large the great industrial structure of the United States is owned by the people who work for it in a cooperative venture that brings great good to all of us.

No, the idea that worker and stockholder sit on opposite sides of the street and try to pull in different directions is one of the great misconceptions of the day.—Crawford H. Greenewalt.

* * *

Colorful Fabrics. More colorful prints in weather-resistant upholstery on new outdoor furniture were shown at the New York Summer Furniture Market Week, October 25-29. The trend, seen in collections of four leading furniture manufacturers, is the result of Permatex Fabric's perfection of multi-color printing in hand-screened prints coated with "Ultrosol", a vinyl resin coating that withstands abrasion and moisture; that is highly resistant to alcohol, acids, alkalies, vegetable and body oils; that remains flexible even at sub-zero temperatures. All of the Ultrosoled fabrics are washed easily with ordinary soap and water.

Gulf Coast Boom. Virtually neglected by national manufacturers until recent years, our Gulf Coast today has become a manufacturing center of prime importance. Here, America's giant chemical industry is capitalizing on the untapped resources of the Gulf area—its natural gas, its domes of pure sulphur, and its limitless supply of lime. Already chemical concerns have poured almost $800 million into plant expansion in the Gulf Coast area.

* * *

Prevents Mildew. A process which will lock an effective mildew-preventing chemical into linens is announced by Monsanto Chemical Co., St. Louis, Mo. The new process, a modification of an old method for fireproofing textiles, will treat 300-lbs. of laundry for a few cents. Basis of the treatment is a concentrated solution of sodium pentachlorophenate, a water-soluble fungicide, "Santobrite."

* * *

Toys for this Christmas have gone realistic. They actually work. Metal toys will not be too plentiful. For the girls there are vacuum cleaners made of aluminum and plastic equipped with an electric motor. They work just like the big ones. Also washing machines with a spring motor and rubber roll wringer.

Boys will get scale model road graders with balloon tires, automobiles with batteries for a horn, and head-

(Continued on page 9)

lights. Then there is a fire station with hand operated bell and automatic doors, a pumper that squirts real water on painted flames. Add to all of this sewing machines, irons and lawnmowers and it looks like a busy season for the small fry.

* * *

New Plastics. Three new plastics have been announced recently. One is a high-heat resistant, low-shrinkage polystyrene, available in various colors and clear. For products subjected to boiling water or steam this material should prove satisfactory.

The second is a polyester type plastic combined with textiles to make a plastic cloth which compares favorably with armor plate in resisting shell fragments. The same plastic may be molded into noiseless gears, table tops, fluid pipes, etc. It is reported that pound for pound, it is twice as strong as steel.

The third, a new quick-setting plastic is said to be the first major new product introduced in the field since 1945. This material which is mineral-filled has unusual electrical insulating properties, high heat resistance, low moisture absorption and extreme dimensional stability. It requires a very short curing period.

* * *

Executive Training. From progress reports of more than 100 companies who have adopted concentrated training programs, it has been determined that the executive training period may be safely reduced from the former five years to one year, according to Lawrence A. Appley, president of the American Management Association. Exact methods employed vary with individual companies; however, in practically every case, scientific tests reveal the type of training required in each case. Concentrated

(Continued on page 148)

NO RISK OF FIRE!

SAF-TE

removes any finish

SAF-TE Non-Burning Remover makes the difficult job of removing finishes easy — AND SAFE! For SAF-TE reduces paint, varnish, enamel, shellac, lacquer or synthetics to a buttery sludge that peals off readily. *And it simply will not burn!* Leaves surface ready for refinishing —with no after-wash needed.

Let us help you

We've been helping leading industrial firms solve removing problems for over thirty years. Why not let us help you with yours. Fill in coupon.

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125 Chestnut Street, Newark 5, N. J.
We are interested in stripping the finish
from_____
Type of Finish_____
Name_____
Company_____
Street_____
City_____ State_____

Congratulations...

INDUSTRIAL FINISHING on your Silver (25th) Anniversary

It gives us great pleasure to offer to Industrial Finishing Magazine our heartiest congratulations and we gladly relinquish this November front cover position. We are proud to have been one of their early supporters, having placed our initial advertisement in the April 1925 issue and we have been a consistent advertiser ever since, confining our advertising exclusively to Industrial Finishing. We congratulate them on recognizing the need for a finishing magazine and on the successful pioneering they did in the early stages when the finishing industry was sorely in need of such a magazine.

We congratulate them on the splendid job they have done over the years and on the excellent job they are doing today. They pioneered the field, have grown with the industry and are doing a marvelous job today.

THE Lilly COMPANY

FINESTIES

High Point, N. C.

"I'll bet $200,000 on the red..."

If you want to risk the loss of thousands why not have fun doing it . . . at the roulette wheel or the race track?

But can you afford to take the same risk in the selection of the right color or type of finish for your products?

You won't take a chance if you call your R-M representative . . . a man who, with the help of excellent laboratory facilities, has learned to eliminate guesswork. Write us today.

RINSHED · MASON COMPANY
5935-71 MILFORD ☆ DETROIT 10, MICH.

R·M

REG. U.S. PAT. OFF.

Manufacturers of Industrial, Automotive and Architectural Paints, Lacquers, Enamels, Varnishes and Undercoats for all special and standard requirements.

WITH THIS ISSUE, INDUSTRIAL FINISHING magazine begins its 25th year of publication. It bears the same name, serves the same cross-section of manufacturing industries, and has the same owners and executive personnel as when the first issue appeared in November, 1924. Its purpose, as announced in the introductory editorial of the first number, remains the same, namely—"To present in a single independent publication the latest authoritative information covering all phases of finishing, as it relates to various manufacturing industries that use organic finishes; to provide a convenient unbiased medium through which practical and technical men can exchange experiences, and to which they may look for stimulating ideas and helpful suggestions."

Early in the 1920's, new finishing materials, improved equipment and faster methods for production finishing and painting began to appear on the industrial horizon, but no magazine on finishing was in the field to publicize this information. The need for an independent publication to serve this important phase of several industries became so obvious that three Indianapolis men, experienced in publication work, decided to do something about it. Accordingly, W. H. Rohr, E. A. Dosch and R. E. Suits, with an associate, Mr. A. T. Gaumer, formed a corporation and made plans for launching the first monthly publication devoted exclusively to product painting and finishing in manufacturing plants. Inasmuch as it was to be directed to all industries that finish or paint their products, the magazine was named INDUSTRIAL FINISHING.

W. H. ROHR

The editorial policy agreed upon was to publish practical informative articles, illustrations and brief news items of timely interest and specific value to key men in the industries it elected to serve. Since the magazine and its executive personnel were independent of any other interests, the publishers felt that a policy of high editorial ethics must be established and closely adhered to. That policy still continues.

Reader response to the first issue was immediate and favorable. The magazine was read not only by users of finishing materials and equipment, but by manufacturers, distributors and salesmen of these products.

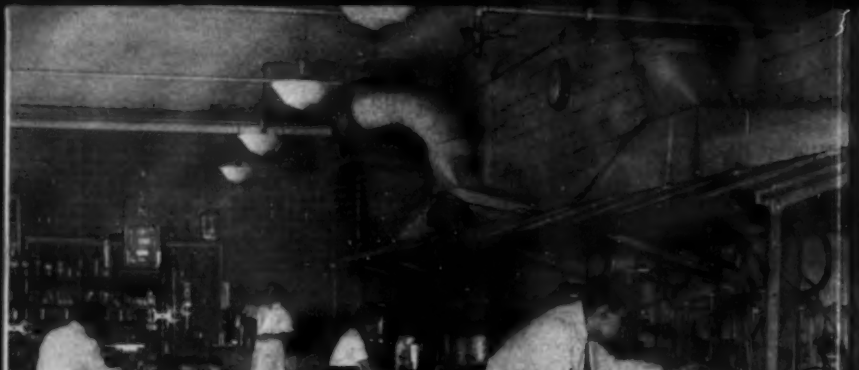
Large manufacturers of varnishes, lacquers and paints had no appropriation for industrial advertising at that time because no finishing publication had been in the field. These concerns looked through the early issues of INDUSTRIAL FINISHING carefully and appraised it critically from all possible angles before even thinking about appropriating any money to spend for advertising. The more they looked, the more convinced they became that INDUSTRIAL FINISHING Magazine was the logical publication to effectively perform a needed service in the industries they wanted to reach. Makers of equipment and supplies for modern finishing rooms and product painting departments looked over the magazine and reached the same conclusion. Accordingly, advertising support soon began to show up in real volume.

In this Silver Anniversary year, INDUSTRIAL FINISHING is proud of the fact that its Editor, W. H. Rohr; Director of Advertising, E. A. Dosch; and Circulation Manager, R. E. Suits; the present three officers of the corporation—are the same men who started the magazine. These men have no other business interests or connections. Their full time, efforts and enthusiasm are given toward keeping INDUSTRIAL FINISHING supreme both in editorial excellence and advertising value.

Officers of the company are assisted by our New York representative, Mr. C. A. Larson, who has been with us since the first issue was published, and our Associate Editor, Mr. P. C. Bardin. Many of you in the industry have met one or more of these men. Their pictures are reproduced on these pages.

The publishers of INDUSTRIAL FINISHING take this occasion to thank its readers, friends and advertisers for their encouragement and support, and to assure them that the magazine will continue its high standard of editorial excellence and the fine quality of all other elements that enter into the make-up and distribution of the publication every month.

C. A. LARSON E. A. DOSCH R. E. SUITS P. C. BARDIN



★ 25 YEARS OF INDUSTRIAL Paint Progress

By PAUL O. BLACKMORE

Division Technical Manager
Interchemical Corp., Finishes Division

A SILVER ANNIVERSARY always provides a golden opportunity to reminisce. Therefore, on this 25th birthday of INDUSTRIAL FINISHING Magazine it is fitting to look back across the years and see what time has done to an industry that is as old as history itself...

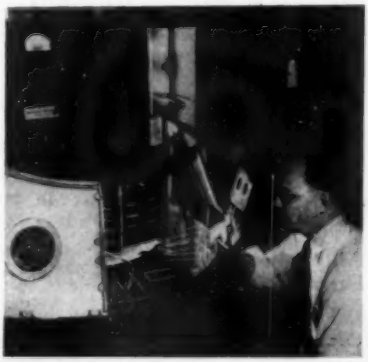
Back in 1923, nitrocellulose lacquers were just beginning to come into their own. Nitrocellulose was discovered by Schonbein in Basle, Switzerland in 1846. However, no commercial use of the discovery was made until 1868 when Hyatt invented celluloid by combining nitrocellulose and camphor.

The development of nitrocellulose lacquers was retarded by the fact

that the early nitrocellulose yielded solutions of extremely high viscosity and low solids, requiring multiple coats to build up an adequate film thickness. Good nitrocellulose solvents, such as ethyl, butyl and amyl acetates, methyl ethyl ketone, methyl isobutyl ketone and others, were not available in commercial quantities or at prices that made nitrocellulose lacquers attractive. The first world war stimulated research and production on both nitrocellulose and suitable lacquer type solvents, with the result that both became plentiful in the post-war era.

Nitrocellulose Lacquers Became Popular Finish

Because of their rapid drying and excellent durability, according to then existing standards, nitrocellulose lacquers grew rapidly in popularity. Since that time, the quality of nitrocellulose lacquers has improved in several directions. The advent of innumerable synthetic resins, plasticizers and solvents permitted solids at spray viscosity that are twice what they were in the early 1920's.



Chemist at a Fade-Ometer. This test gives the accelerated ultraviolet light and heat breakdown of paints and varnishes to simulate the effect of real sunlight. Photograph, courtesy of Standard Oil Co. of N. J.

The use of high ratios of synthetic resin to nitrocellulose resulted in lacquers of higher gloss, better durability and better adhesion. Chalking and checking tendencies were materially reduced. Nitrocellulose itself became available in much lower viscosities than formerly, which also added to the percentage of total solids. Advances in pigment technology resulted in colors of greater brilliance and permanence.

Synthetic Baking Enamels Versus Lacquers

In recent years nitrocellulose lacquers have encountered more competition from the synthetic baking enamels. While some automobile manufacturers have turned to these synthetic enamels for their body finishes, still others prefer to use nitrocellulose lacquers. The merit of synthetic enamel is principally in the elimination of sanding and polishing costs, and it chalks more slowly on exposure. Synthetic enamels do not take as high a polish because of minute scratches left by the polishing cloth and compound.

Nitrocellulose lacquers will be with us for many years to come. They are still the preferred finish for wood products by the great majority of wood fabricators, although synthetic baking finishes are making inroads there also. However, the baking of finishes on

wood requires more careful control and the availability of humidified ovens if pinholing and blistering are to be avoided. Lacquers are simpler to use from a production man's standpoint. As the parade of new synthetic resins and plasticizers continues, their quality will be still further improved, although it is doubtful if the next 25 years will show an equivalent gain in quality and volume.

It is in the field of synthetic resins that progress has been most startling. In the early 1920's, only few synthetic resins were available in commercial quantities, and these were limited in their use. Ester gum, the reaction product of rosin and glycerine, was in volume production and was being used in making oleoresinous varnishes and lacquers.

Synthetic Resins Offered New Possibilities

Phenolic resins had been known since Dr. Leo Baekeland announced his discovery in 1909. However, the early phenolics were not capable of reaction with vegetable oils, nor were they soluble in organic solvents; this made them entirely unsuited for use in protective coatings. By the early 1920's, chemists had learned how to use these resins in varnishes, and a new line of fast-drying, water- and chemical-resisting enamels resulted.

Many modifications of phenolic resins appeared, and because of the unusual properties they imparted to paint and enamel films, they quickly took the spotlight away from the natural resins which had held forth for so many years.

The last quarter century has seen phenolic resins become more pale in color and show much improved color retention. Their chemical resistance properties have also been improved. Phenolic resins do a yeoman's job as linings for kits and drums in which chemicals are stored and shipped, as well as in sanitary can linings which protect our foods from contamination by the metal container.

Fast-Drying Synthetic Finishes Developed

Of particular interest during the last war were the *phenolic dispersion resins*. These resins were produced by reacting the phenolic resin with an oil (usually tung) and carrying the resulting varnish to an extremely high state of polymerization. These varnishes, actually carried to a state of complete gellation, were redispersed in colloidal form in organic solvents.

In effect, this amounted to predrying the paint film under carefully controlled conditions before the paint was actually applied. The pre-dried film, like a lacquer, dries solely by solvent evaporation. Coatings formulated with these resins will air dry to handle in one or two minutes without heat and can be re-coated in five to ten minutes.

Alkyd Resins; More Durable White Enamels

The early 1920's saw the introduction of alkyd resins on a commercial scale. The reaction of glycerine and phthalic anhydride, to form a resinous substance, was reported in the chemical literature many decades ago, but it was not

REVOLUTIONARY! NEW!

Self-Leveling LACQUER and VARNISH

Now Available in Production Quantities

Cut your wood finishing 25%—or more!

Here are two revolutionary products that may drastically slash your wood finishing production costs.

One is LEVELAC, a new kind of lacquer. The other is LEVELVAR, an amazing new varnish. Both flow on so smoothly that sanding and rubbing time are reduced to an almost unbelievable minimum.

You also benefit by a decided improvement in appearance and slick feel—for both products level out and dry to a glass-smooth finish. Both are available in gloss, semi-gloss and flat.

Until now it has been necessary to restrict the use of these outstanding finishes to a few of our regular customers. Now, new production facilities make it possible to serve your requirements.

These products have been accepted for use with every demonstration made. Write, phone or wire for our technical representative to come and prove our claims right in your own plant. No obligation, of course.

Industrial Division, **AMERICAN-MARIETTA CO., 43 E. Ohio Street, Chicago 11, Ill.**

A-M
LEVELAC
Self-Leveling Lacquer

A-M
LEVELVAR
Self-Leveling Varnish

A-M

American-Marietta

FINE INDUSTRIAL FINISHES

until after the first world war that any commercial use was made of the discovery. Alkyd resins are resistant to the destructive effects of ultraviolet light to an unusual degree, hence their use in an enamel results in an improvement in exterior durability and color retention.

Alkyd resin's first big job was on household refrigerators where it imparted a gleaming whiteness that lasted almost indefinitely, and a resistance to chipping and mechanical damage which, together with lower cost, soon caused many manufacturers to turn away from vitreous enamels for refrigerator exteriors. Higher solids, higher build and gloss, lower solvent costs, excellent durability and color retention made it look for a while as if nitrocellulose lacquers would lose their place in the sun. However, these very same alkyd resins are largely responsible for the spectacular improvement which has taken place in lacquers and which has enabled them to retain a substantial share of the protective coatings market.

The early alkyds, while faster drying than the oleoresinous varnishes which were then known, were still quite slow by present day standards. Improvement in drying-oil technology has resulted in vastly improving the drying speeds, initial paleness and color retention of the alkyd resins. Today, their number is legion, and with all of the permutations and combinations available, it is no wonder that the protective coatings technician is left a bit bewildered when it comes to a selection of the best resin to do a certain job.

Measuring the enamel-to-metal adherence.

The latest development is the "styrenated" alkyd, which is made by copolymerizing 30% to 40% of styrene with the alkyd resin. This treatment results in still further improvement in the drying and increased resistance to water and alkali.

Developments in Drying Oils For Industrial Finishes

The story of 25 years of progress would not be complete without some mention of the accomplishments of the oil chemist. It has come to a point where raw oils are rarely used as such. Instead the oil chemist takes them apart, molecule by molecule, discards or modifies the portions which impart the undesirable properties, and puts them back together again in whatever proportions will yield the properties he desires.

By means of these chemical trickeries, the chemist has made the formerly non-drying castor oil into one of the best drying oils we

Twenty Million
Gallon Reasons
Why we lead the field...

IN

LACQUER THINNERS

BARKER

BARKER CHEMICAL COMPANY

One of America's Largest Manufacturers
of Lacquer Thinners

2258 SOUTH UNION AVE. • CHICAGO, ILLINOIS

have. He has made linseed oil dry almost as fast as tung oil. Today an oil is considered to be just as much of a chemical raw material as glycerine, formaldehyde, phenol or any of the other starting points for resin synthetics. Furthermore, the parade of progress is not over. The chemical, styrene, has also invaded the field of oil chemistry, and "styrenated" oils are presently creating quite a furor. Copolymers of oils with other vinyl type monomers also offer interesting new film forming materials.

Comes 1937 and New Speed-Bake Finishes

In 1937, users of industrial finishes were electrified by the announcement of a new speed-bake finish which cut baking cycles down to five minutes or less. Public reaction to this announcement was mixed. Some were certain that any finish which baked so fast must be brittle and lack adhesion. Others who had the courage to investigate discovered that its hardness surpassed anything they had ever seen; its gloss and fullness were the equal of anything available up to that time; and its clarity and permanence of color were beyond their fondest dreams. Above all, its baking speed seemed to be limited only by how rapidly heat could be pushed into the object being baked —and all of this with excellent flexibility and adhesion. This finishing miracle was the result of the introduction into the paint industry of butylated urea-formaldehyde resins which, in their unbutylated form, had been used for a number of years in the manufacture of colorful molded plastic articles.

A laboratory man is tending an open-type laboratory varnish kettle used in the process of "cooking" resin into vegetable oils to make varnish. Photograph, courtesy of Standard Oil Co. of New Jersey.

This development came close to creating a revolution in the finishing industry. One's entire conception of film properties, application methods and ultimate performance had to be revised. Baking schedules were reduced from one or two hours to only a few minutes. Films of unprecedented hardness coupled with unusual flexibility and adhesion were made possible—a combination of properties that had heretofore been considered fantastic. Formerly, a high degree of one had been obtained only by an equivalent sacrifice of the other.

Flexibility; Adhesion; Gloss; Hardness; Quick Drying

This unique combination of properties was the result of blending the urea resins with our old friends, the alkyds. The alkyds imparted

(Continued on page 41)

flexibility, adhesion and gloss, while the urea imparted hardness and speed of cure. For the first time, the phenomenon of polymerization had been employed in a protective coating to a high degree.

True, some polymerization always had taken place whenever an oil, a varnish or an alkyd resin was subjected to heat. However, these new finishes dried almost wholly by polymerization, and since this reaction takes place much faster than oxidation and is accelerated by heat, the limiting factor in baking speed was the rapidity with which heat could be packed into the object without disrupting the orderly elimination of solvent and the products of combustion.

Improved Baking Ovens Enter the Picture

At about the same time that these new products hit the market, new methods of rapid heat generation became available in the form of infra-red ovens and induction heating. With the proper combination of materials and equipment, it is now possible to bake certain metallic objects to complete cure in as little as eight or ten seconds. However, the economics of so doing are still open to question.

A year or two after the appearance of urea resins in protective coatings, another newcomer, melamine, made its bow. Melamine still further reduced baking schedules, increased film hardness and furnished improved resistance to heat and water. Today, these unusual finishes can be seen adorning household appliances in practically every home. Compared with the finishes existing in the early 1920's, they offer a most spectacular measure of 25 years of paint progress.

Vinyl Resins Resistant to Acids, Alkalis, Chemicals

The vinyl resins were another extremely important contribution to the progress of the last 25 years. The name "vinyl" is a generic term applied to all of the class of resins whose composition is characterized by the so-called ethylenic grouping ($H_2C=CH_2$). This carbon-to-carbon double bond has the ability to combine with itself to form polymers, and a whole series of resins are the result of researches in this field. Among them are polyethylene, vinyl chloride, vinyl acetate, acrylic and methacrylic esters (Lucite), vinylidine chloride (Saran), acrylonitrile, styrene and many others.

These resins are extremely tough and elastic. However, they are high in viscosity and therefore low in solids, when applied from solution. They are extremely resistant to acids, alkalis and most other chemicals.

The chlorides are relatively unstable to light and heat but may be effectively stabilized by the use of certain additives. Their use in protective coatings is growing rapidly and will be still further stimulated by the use of recent techniques whereby the resins are applied in powdered form in a state of only partial solvation. The partial solvation causes the resin particles to develop enough cohesion to hold the films together until the objects so coated can be placed in an oven and the temperature of the coating can be raised above the melting point

of the resin, at which point the film fuses to continuity and develops the properties characteristic of the resin.

These coatings, known as organosols, permit application at high solids and low solvent cost, and provide film thicknesses comparable to conventional type enamels, a feature never before present in vinyl enamels.

In the paper and cloth coating fields, vinyl resins in solution in chemical plasticizers are applied at 100% solids. They are applied hot and are calendered to smoothness. These materials, known as plastisols, are responsible for the current availability and relatively low cost of vinyl coated fabrics.

Various types of vinyl resins are now being copolymerized to form interesting new film-forming materials, and it is difficult to predict just what new miracles the future may bring.

A brand new series of resins were introduced to the industry just this year. They are products of the reaction of bis-phenol and epichlorohydrin, the latter a relative newcomer to the field of protective coatings. These resins may be cooked with oils or blended cold with certain amine type catalysts to form very fast-curing, chemically inert films characterized by toughness and adhesion.

Silicones Used to Make Heat-Resistant Coatings

One of the most spectacular developments of recent times is in the field of silicone chemistry. For a number of years we have been educated, via the radio and press, to an awareness of the miracles that can be performed starting with the raw materials coal, air and water. We shall not pause at this point to question the justification of such a statement. Let it suffice to say that, if it is justified, then, by the same token, we are permitted to add a fourth abundant raw material to the list, namely, sand. From the sands of the sea, by devious chemical transformations equally as complicated as those involving coal, air and water, we inherit a whole new series of compounds with most unusual properties. One of them, bouncing putty, has captured the popular fancy although its practical value remains extremely obscure.

In the field of electrical insulation, silicones have done an outstanding job. Because of their unusual heat resistance, the insulation on motor windings does not undergo thermal breakdown, with the result that silicone wound motors can be operated at considerable overloads without damage to the insulation. Silicone elastomers have greater resistance to extremes of heat and cold, as well as to chemicals, than the natural or synethtic rubbers. In protective coatings, silicone enamels have established new highs in resistance to elevated temperatures. White enamels are available which will withstand many hundreds of hours of exposure to temperatures in the vicinity of 500° F. with little or no change in color or gloss. Twenty-five years ago, 200° was just about tops for pigmented enamels.

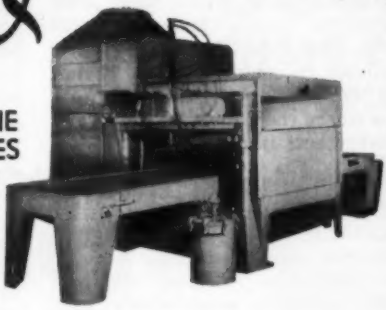
Silicone enamels also show promise of unusual exterior durability. Being closely allied to glass, their

Paasche

MANUAL and AUTOMATIC AIRPAINTING EQUIPMENT

ONE OF MANY TYPES

F42-SLC Straight Line Conveyor Automatic Aircoating Unit with waterwash booth. Used for airfinishing Wall Boards, Trays and many other flat objects. Aircoating capacity up to 28,000 sq. ft. per hour. PAASCHE AUTOMATIC AIRCOATING UNITS are designed to fit the product. There is a Paasche unit designed to solve your finishing problem. It will pay you to consult with Paasche Airfinishing Engineers.



F1037 PRESSURE TANK AIRPAINTING UNIT

For High Production Work

This compact unit is used extensively for airpainting the interior and exterior of factories, office buildings, hospitals, bridges, storage tanks and general plant maintenance work.

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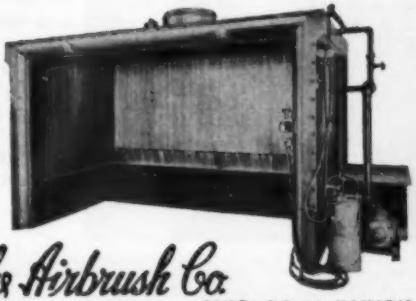
Endorsed by the hundreds now in use in leading Industrial Plants. Provides Maximum Fire Protection — Modern Healthful Working Conditions. Save time and cleaning costs with this modern self-cleaning Water Wash Booth. When air is exhausted to the outside, it is clean and free of all solids or paint particles. Meets all requirements of the National Board of Fire Underwriters and other regulatory bodies. Made in sizes to fit your requirements. Prices quoted upon request.



Paasche Airbrush Co.

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43 YEARS AIRPAINTING EQUIPMENT PIONEERING

inertness to the ravages of weather is understandable. Whatever new highs they have established in performance, they have more than matched in price, and there is little prospect of any worthwhile price reductions in the foreseeable future. However, they are readily available in commercial quantities, and are being sold for specialty uses where their unusual properties justify their unusual price.

White and Colored Pigments for Enamels

In the field of pigments, progress has been equally rapid. Twenty-five years ago, lithopone and zinc oxide were the most widely used white pigments. Their low hiding power made solid covering, one-coat white enamels an impossibility. However, with the advent of titanium dioxide, high hiding whites with good color retention became a reality. Over the years, titanium pigments have been continually improved in color retention and chalk resistance, and more improvements are still to come.

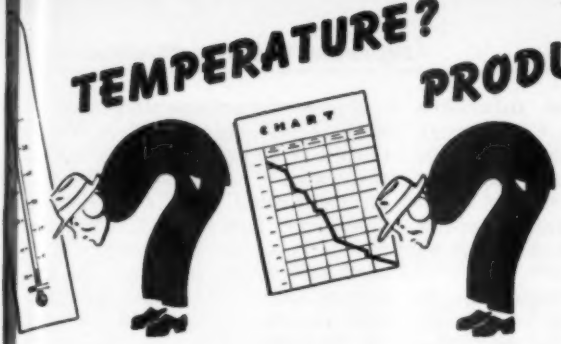
Laboratory assistant operaitng a 3-roller type of laboratory paint mill. This picture shows the process of grinding pigments into varnish to make paint and enamel. Photo, courtesy of Standard Oil Co. of N.J.

In the field of colored pigments, we have seen the development of numerous new organic colors. Of these the phthalocyanine blues are probably the most spectacular. In the inorganic class, we have the new transparent gold pigments based on hydrated ferric oxide. In combination with metallic powders and such pigments as phthalocyanine blues and greens, extremely brilliant and light-fast colors are possible. These pigment combinations are responsible for the beautiful color styling on our modern automobiles.

It is hoped that readers will understand that in the brief space of a few thousand words, it is impossible to treat the 25-year progress of an industry in minute detail. I have tried to present some of the more spectacular developments. Time and space make it inevitable that some of them must be omitted.

A Peek into Future; Trends Now in Evidence

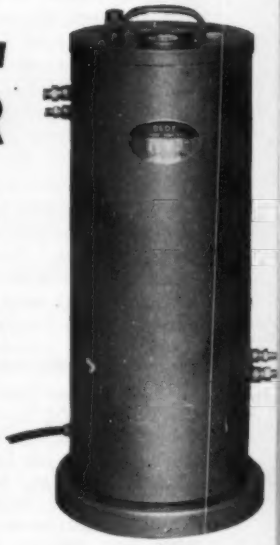
In reviewing the progress of 25 years, one is tempted to look ahead and guess what the next 25 will bring. In this day and age, such prognostication is dangerous business, for who knows what magic the chemists will conjure in their



ARE THEY
DOWN
THESE COLD
MORNINGS?

Step them Up - Quick - with a

BEDE PAINT HEATER



. . . and get higher quality *production finishes* at lower cost! A Bede Paint and Air Heater saves time and labor . . . saves thinner . . . saves paint.

At the high operating temperatures produced by the revolutionary Bede hot spray method, viscosity is reduced, giving faster production with greater coverage, using less thinner.

One coat often takes the place of two . . . more material can be handled with fewer strokes covering larger areas. A smooth even film of paint is produced with less orange peel, less sag and fewer rejects.

Get the facts on this safe, simple, compact unit which can solve many of your finishing problems and cut your finishing costs. Write for complete information and data.

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BEDE PRODUCTS Inc.

INDUSTRIAL FINISHING SPECIALTIES

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test tubes? As the automobile quickly made the horse and buggy obsolete, so the machinations of our country's technical men may revolutionize the protective coatings industry before the golden anniversary of INDUSTRIAL FINISHING Magazine rolls around.

However, certain trends are in evidence. The industry is certainly going synthetic in a big way. New film formers are appearing almost daily. The trend is to higher and higher solids at application consistency. Finishes that will pass through a spray gun at 100% solids are already on the horizon. It is doubtful that faster curing speeds will be achieved. When we are already down to seconds, there is little room left for progress in that direction. Nevertheless, it is possible that finishes will become available that may be catalyzed to cure at room temperature.

Further improvements in ease of application, appearance and durability can be expected. Continuous processing of paint products is being considered and is a distinct possibility. New methods of testing that are continually being developed will result in better quality control and better knowledge of how a given product will perform in the hands of the customer and the customer's customer.

The protective coatings industry is not going to be devoured by plastics. The technology of the two are so closely allied that whatever in the way of new developments occurs in one will accrue to the benefit of the other. It is certain that during the next 25 years, INDUSTRIAL FINISHING Magazine will have plenty to report to its readers. I extend my best wishes for its continued popularity and prosperity.

"I have been informed that your November issue will commemorate the Twenty-fifth Anniversary of the founding of INDUSTRIAL FINISHING. This provides the occasion and the opportunity to tell you what I think about the splendid work you have done since you published the first issue in November 1924, in which our advertisement appeared.

"In our organization INDUSTRIAL FINISHING has been the book for complete and accurate information on modern finishing practices. During your first quarter of a century the developments in the field of organic coatings have been dynamic and amazing to those who have kept pace with it over the years.

"INDUSTRIAL FINISHING, in my opinion, has made a notable contribution to our industry in keeping us abreast of the continuous and progressive developments. All of us who are identified with the industry owe your organization an everlasting debt of gratitude for a job well done.

"The H. Behlen & Bro. organization takes this occasion to extend to you our heartiest congratulations on your 25 years of service and we hope it will be our privilege to help you celebrate your Golden Anniversary.

"May INDUSTRIAL FINISHING continue to grow in power and influence and reach greater heights in achievements during the next 25 years."—*Herman Behlen, H. Behlen & Bro., Inc.*

AMAZING TAPE SOLVES PROBLEM FOR SHIPPERS OF ENAMELED GOODS

Hold movable parts firmly in place during shipment with a special new cloth tape that *pulls off clean* and *leaves absolutely no stain* or discoloration! Bauer & Black Industrial Adhesive Tape No. 158 was specially designed to meet the need, among shippers of enameled goods, for a strong, non-staining binding tape. Here are the main advantages of Tape No. 158:

TENSILE STRENGTH: 46 lbs. per in. of width.

PULLS OFF CLEAN, with no messy residue. Retains this quality at high temperatures—up to 180° F.!

ABSOLUTELY NON-STAINING, non-discoloring. Safely used on many white and pastel finishes (alkyd, urea and nitrocellulose lacquers). In photo above,* workman is applying Tape 158 to Kitchen-Kraft wall cabinet doors finished with Dupont Dulux baked-on enamel.

WRITE US for FREE test samples. Inquiries welcome. No obligation. Address Dept. 610, 2500 S. Dearborn St., Chicago 16.

*Courtesy of the Midwest Mfg. Co., Galesburg, Ill.— one of the largest manufacturers of steel kitchens

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Industrial Adhesive Tape

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Production Short Cuts to Reduce Costs • Research to Speed and Improve Methods

PROGRESS ☆ IN MODERN FINISHING EQUIPMENT

WHILE THE PAST 25 years have seen great progress in the development of new and improved finishing materials, equally remarkable advances have been made in equipment, tools, accessories and methods used to prepare surfaces for coating, to apply the coatings, to dry or cure those coatings, and to move the work in process from one station to another. Manual, semi-automatic and completely automatic facilities for cleaning, drying and smoothing the surfaces of parts and products to be painted or finished are available for every need in industry. Many are standard products and a few are custom built to certain specifications.

Spray Equipment Has Made Remarkable Strides

Any mention of mass production painting and finishing in a factory immediately calls to mind spray guns, both manual and automatic. Manufacturers of spray guns and spray equipment are among the most progressive firms that supply users of product painting facilities. Their engineers have developed many new ideas and some remarkable improvements for industries that use their products. They have lead the way in designing and making better spray guns to perfectly atomize and quickly apply the new paints, varnishes, lacquers and synthetic enamels.

Old style suction-feed and gravity-feed containers, used in connection with spraying, have been largely replaced by the modern pressure-feed tanks with mechanical agitators. The use of pressure-feed tanks eventually led to the development of paint circulating systems wherein separate mixing and supply tanks for each color or each type of material are located in a separate fireproof room. The prepared material is pumped through a system of pipes to spray booths and back to the supply tanks where it passes through filters before it is returned to the booths.

Water-Curtain Spray Booths Plus Other Improvements

Flexible non-kinking air hose and fluid hose with liners, made to resist the action of solvents, have replaced the curled air hose and the old style fluid hose which lasted only a short time.

Manufacturers have learned many things about spray booths during these past 25 years. The water curtain spray booth offers many advantages over the old style dry booth wherein the exhaust fan alone is responsible for removing practically all overspray. In the water curtain booth all overspray (except what contacts the sides of the booth) is exhausted through a curtain of water which separates the paint particles from the air. The overspray is accumulated in tanks as sludge. This makes for cleanliness, reduction in fire hazard, and the possibility of reclaiming the sludge if or when this is desirable.

More efficient and safer lighting of spray booths; better circulation of air across the front of booths; pressurized spray rooms; automatic spraying installations, safe removable coatings to catch any overspray that settles on the dry sides of the booth—all come within this period.

Flowing, Rolling, Dipping, Tumbling, Whirling

Improvements have been made in other methods of applying coatings to various parts and products—for example, flow coating, roller coating, dipping, tumbling, dip-whirling, and screen printing.

The more extensive use of overhead monorail conveyors has made it possible to put both flow coating and dip coating on a continuous line production basis, in many instances. Descriptions and illustrations of typical setups of this kind have appeared repeatedly in recent issues of INDUSTRIAL FINISHING.

Roller coating equipment has been greatly advanced through the use of improved composition rollers; better design; and unitizing the roller coater with a hydrogen relief oven, bake oven, and mechanical winding devices for finishing continuous metal strips. For roller coating sheet stock, the elevator feed table and modern "finger" conveyor to carry the coated sheets through the bake oven have greatly increased the efficiency and speed of this work.

Coating by Dipping; Added Safety Feature

Coating products by dipping is probably centuries old, but the past quarter century has seen the advent of conveyorized dipping plus electrostatic detearing (removal of clinging tear drop after dipping) by passing the dipped products through a high-voltage, low-amperage electrostatic field.

Air impulse agitators for dip tanks, as well as surface agitators to remove bubbles from the outfeed end of the tank, make for more efficient dipping. Large installations employ a paint-circulating system. Material in the dip tank is pumped back to the supply room through filters and then back to the tank. Tests are made at regu-

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"Please express my personal congratulations to Mr. Rohr, Mr. Suits and your associates for developing such an interesting publication, and one that has grown to be a work manual for the industry."—*Erick S. Davidson, President, Davidson Engineering Co., Inc.*

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lar intervals in the supply room and solvents are added as required.

In connection with dipping a safety feature is the underground reservoir connected to the dip tank by valves so that in case of fire, the contents of the dip tank may be quickly dumped to safety. Improved automatic, chemical fire-fighting equipment is now used over both large and small dip tanks.

Dip-Whirling and Tumbling Machines

Closely akin to dipping is the improved dip-whirl or centrifugal machines in which small parts or products are placed in a wire mesh work basket which is locked into position inside the machine. The lacquer or enamel container is mechanically brought up around the work basket to coat the parts. Then it is lowered and the work basket is whirled clockwise and counter clockwise for several seconds to remove the excess material which is thrown off by centrifugal force but caught inside the container. This is a fast and efficient method of coating very small parts in bulk.

Fundamentally, tumble finishing has remained about the same for many years, but new finishing materials, exhaust systems to remove fumes, better designed barrels, and combination spray and tumbling in tilted open-top drums have vastly improved the technique.

Complete and Partial or Spot Coating by Screen Process

The process of screen printing —that is of forcing process paint or clear material (such as an adhesive for flock) through a screen by means of a rubber squeegee is old but the mechanics of the operation have been expanded to permit mechanized screen printing of round, oval and odd-shaped objects such as perfume and cosmetic bottles, lip stick holders, soft drink dispensers, etc. Further advancement may be found in screen making. Especially noteworthy is the photographic, carbon tissue stencil which permits 4-color screen processing through halftone screens. The results of this type of work compare favorably with offset printing and, based on comparatively small volume, the cost is much less than printing.

Flock Coating for Decoration and . . .

Flocks and their application are products of this era of progress. Flock's popularity as an insulator and sound deadener, as well as for decorative uses, is on the increase. Flock fibers are available in various colors and lengths from 1/32-in. to ¼-in., in rayon, cotton, wool and animal hair. Clear or colored adhesive—either water-soluble glue type or enamel—is applied to the surface by screen printing, roller coating, spraying or dipping, depending upon the size, shape and type of product. While the adhesive coating is wet, the flock fibers are applied to the surface by beater bars, mechanical sifters, or sprayed on with a special gun.

Flock may also be applied electrostatically. Its principal use as an insulator and sound deadener is found in the aircraft industry. As a decorative coating, flock is often

Eye-deal for sales
One sure way to the American pocketbook is through the eye. If your idea of the ideal finish is spelled "eye-deal," let us get together. Our experience in developing sales-sparking finishes is a long and varied one.
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LISTER AVENUE, NEWARK 5, N. J.

used on turntables for record players, greeting cards, juvenile books, fancy boxes, cases, show cards, etc.

Masking to Spray Multi-Color Jobs

The art of masking more or less intricate areas for two or more color applications has received great impetus within the past quarter century. Precision metal masks, designed to prevent any overspray from contacting the product, have been perfected. An added feature of these masks is the elimination of any tie marks in letters and designs, such as the letters O and D. These masks have been a boon to the manufacturers of 3-dimensional name plates, emblems, signs, automobile-horn buttons and instrument panels.

Masking tape which is easily removable may now be had in various widths to suit every purpose. It is used to prepare surfaces before spraying wide stripes and 2-color paint jobs on automobiles, busses, truck bodies, or any other metal or wood products.

Ovens for Curing and Baking Paint Coatings

All of the modern, improved finishing materials could not possibly fulfill their functions to the fullest extent if great improvements had not been made in ovens and equipment for baking various paint coatings. The oven industry, both convection and infra-red has kept pace with various other developments in product painting.

Much has been learned about oven design, insulation, air locks to prevent heat loss, recirculation of air inside the oven, thermostatic controls and controlled humidifiers. Properly insulated ovens are often placed on the roof of the building to conserve working space in the finishing room. The efficiency of these A-type ovens on the roof is in no way impaired. Also, it must be borne in mind that if it were not for the modern conveyor equipped with swivel hangers, this type of oven would be economically impossible.

Within this age of progress has come the infra-red oven or tunnel and various portable units. This extremely fast method of baking finishes has been expanded, through the use of many technical improvements, to bake synthetic enamel finishes on large products such as automobile bodies. Here again the conveyor—of various types—contributes greatly to the controlled baking of finishes by infra-red lamps. The use of various watt lamps commensurate with the mass of metal—based upon actual and definite knowledge obtained through tests made by running thermocouples through the oven at different levels—has contributed much to the success of this type of finish baking. Oven design and longer-life infra-red lamps have played a big part in the economy of infra-red baking.

Portable Machines for Sanding and Rubbing

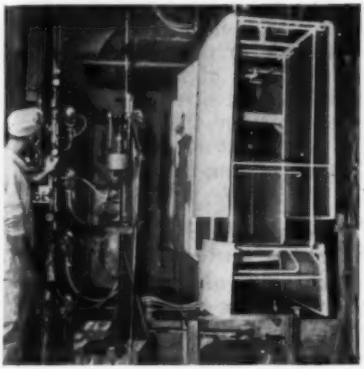
This period of progress has brought the industry the portable filler padding-in machine; also the portable rotary and reciprocating sanders and rubbing machines. Filtered-air-cooled motors for electric machines and foolproof oilers for air-operated machines have extend-

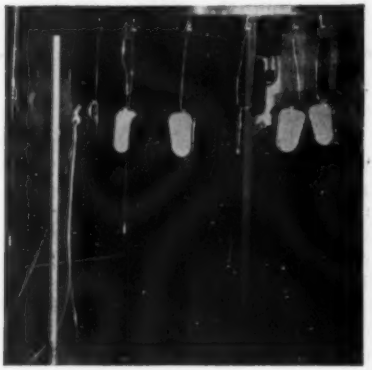
MODERNIZE WITH ELECTRO-SPRAY

ON REFRIGERATOR CABINETS, Electro-Spray increased production 45% in less floor space—will save over $100,000 annually on just one coat.

RANSBURG

ON TRUCK SIGNAL FLARES, Electro-Spray competes with former dipping operation in paint mileage, increases production 50% with same labor.





Large product or Small

you'll save 40 to 60 percent

Operating records on product after product—large and small, even articles which never before could be painted automatically—prove that it pays to modernize with Ransburg Electro-Spray.

By letting electrostatic forces do the work, Electro-Spray saves 40 to 60 per cent on paint alone . . . usually reduces spray stations to just one booth, manned by one attendant . . . and holds rejects to a fraction of other methods.

Ransburg engineers are ready to help you investigate the advantages of Electro-Spray as applied to your particular painting operation.

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Indianapolis 7, Indiana

ed the life of these machines. Sponge rubber pads make it possible to successfully sand or rub gently curved surfaces. Air-operated portable sanders are used for wet-sanding automobile bodies to speed up the operation and reduce costs. Similar portable machines can be used for rubbing the finish on flat or slightly curved surfaces.

Heating Materials Before Spraying Them

Within the past several years paint heaters have become quite popular. Many years ago heater units were used for applying hot lacquer, the theory being that higher solids lacquers could be used. Due to advancements in formulation it became apparent that exceptionally high-solids lacquers could be applied without the aid of heat. However it has been found that synthetic enamels, properly formulated for hot application, offer several merits. These include better and more stable control of viscosity; more solids may be applied to the surface with fewer strokes of the spray gun, and less solvents need to be added, therefore less solvents have to be evaporated in the baking process.

Thus far two types of paint heaters are available, a coil type in which the paint passes through a coil that is surrounded by electrically-heated water in an insulated container. The other heater has a circulating pump which constantly circulates the paint through the heater unit. The heating medium may be water for temperatures up to 195° F., or a non-carbonizing oil for higher temperatures.

Both types of heaters are thermostatically controlled and are located between the pressure tank (or the outlet of the supply line in a circulating-paint system) and the spray gun.

Conveyors Developed to Make Finishing Easier, Faster

No review of the past 25 years of progress in finishing equipment would be complete without giving due credit to the conveyor industry. It has contributed the means of moving products speedily and efficiently through the various cleaning, surface preparation, finishing and finish-curing operations. Several different makes and types of conveyors are available for use in finishing rooms and paint shops. In some factories the entire cycle of operations—surface preparation, application of coatings and the curing or baking of coatings—is conveyorized.

"We wish to take this opportunity to congratulate you on the Silver Anniversary of INDUSTRIAL FINISHING Magazine.

"Our organization has been manufacturing industrial finishes for the past 31 years and we feel that your publication is doing an outstanding job for both the industrial finishes manufacturer and the consumer, in creating a better understanding between them. We also feel that your articles are well chosen and give your readers an excellent view of the progress of our industry.

"Keep up the good work and continuance of success for the future."—*Ralph Engel, President, New York Woodfinishers' Supply Co., Inc.*

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FIRST LOW-COST SILICONE-BASE FINISH

WITHSTANDS 1000° F. TEMPERATURE

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- **FIRST commercially priced silicone-base coating.**
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WAUKEGAN ILLINOIS

Here is my idea of retrospect on the last 25 years, that you ask for. As you suggested, I have simply rambled through my memories of this period and have no idea how nearly I came to what you had in mind.

In any event, congratulations on your 25th anniversary and best wishes for many more good years for "Industrial Finishing".—

S P. Wilson

1923–1948 FINISHING MATERIALS

By Dr. S. P. Wilson

Technical Director for The Varnish Products Co.

IN RETROSPECT, the last 25 years are studded with highlights that accentuate a constantly increasing extent and depth of technology, as applied to the manufacture of protective and ornamental coatings. The advent of lacquers of the low-viscosity types and their use in finishing automobiles in 1923 is one of the most vivid and probably the most important. The importance does not lie alone in putting the finishing of production-line equipment on a par with the machining and assembly thereof, cutting the time required from weeks to days and even hours, but is more fundamental in what it started.

That was the change from trade-secret varnish and enamel making to chemical research and control, and the participation of makers of chemicals in the finishing materials industry. This brought on a flood of new resins, solvents, pigments, etc., that still continues and leads to constant betterment of the products of industry.

Lacquers Developed and Used Extensively

The early lacquers were limited in available raw materials. Solvents were in not too bad a position, with ethyl, butyl and amyl acetates, butanol and alcohol, toluol and xylol. Castor oil, dibutyl phthalate and tricresyl phosphate were at hand, and thus solved the plasticiser problems. Resins were the weak point—dammar, shellac, manila and other natural resins, plus ester gum, were about all the form-

ulator had to work with, and it is surprising what he did with them.

As alkyds began to offer stiff competition to lacquers, the lacquer makers took advantage of their excellent durability and began to incorporate them into constantly improved products. Alkyds have taken away a big share of the automobile and truck business, but the improved lacquers still remain a large segment of this field.

In furniture finishes lacquers are far in the lead, but they owe much of their success to the constant improvement of the alkyd and maleic resins in them, as well as to the lowering of nitrocellulose viscosity by improved technique.

There was quite a change from the alkali and heat-reduced powder and film scrap to the continuous-digester brand of ½-second cotton that is even now the backbone of the industry, but ¼-second, 30-centipoise and even less viscous varieties are now available; and these lead to lacquers nearer in solids to the competitive alkyd and varnish finishes.

Pigments for Enamels White and Colored

Pigments have progressed likewise. The basic white has gone from zinc oxide through zinc sulfide to the titanium pigments, with the rutile titanium dioxide now so firmly intrenched that it has become the most sought-after item in the raw material field.

The phthalocyanine blues and greens have given a new order of quality to these colors, while the indanthrene and beta-oxynaphthoic reds and maroons, together with the cadmium colors, give a tremendous improvement at this end of the spectrum. Better methods of dispersion, wetting agents, more care in clarification—all contribute to smoother, finer and more beautiful enamels.

Plastics and Their Influence on Finishes

The phenomenal growth of plastics has been reflected in many of the new finishing materials. The vinyloid group, which includes the vinyl chloride acetate copolymers, the acrylic and methacrylic polymers, styrene and its derivatives—*these are plastics when solid but they are finishes when dissolved or dispersed.* As new plastics are developed, their evaluation as coatings is taken as a matter of course. Some have clicked; others are still on trial.

Ethyl cellulose found great use as a hot-melt for packaging metal parts during the war. Much of this may come back. The acetobutyrate plastics, when modified and dissolved, have potentialities as coating materials. The use of phenol-formaldehyde resins, partially converted, dissolved in alcohols and baked on steel as a basic protective coating, is well established and growing in extent. Some plastics, such as polyethylene and its fluorine derivative are too insoluble to be used as conventional coatings, but they can be flame-coated. The coating gives an almost incredible degree of resistance to corrosive atmospheres.

It is an interesting fact that plastics, which were once considered a menace to the paint and varnish

industry, have not only contributed many useful members to the coatings family, but have afforded considerable use for these products on themselves, as ornamental variations on the basic plastic color.

New Finishes Come, But Old Finishes Remain

Strangely enough, while the new finishes are constantly appearing, practically none has disappeared. Black japans, varnishes, linseed-oil paints, oleoresinous enamels—all are still made and in large quantities. Alkyds and the fast-baking alkyd-amine resin combinations have taken over most of the appliance business, a goodly share of the automotive, some of the furniture, and much miscellaneous business. Yet, millions of gallons of lacquers are still sold, with new applications developing daily. The growth of American economy has been so rapid that there is a place for all products, if and when they are honestly offered for their proper roles.

A modern laboratory is a necessity in the development, formulation and testing of finishing materials for industrial uses.

Novelty Ornamental Finishes Developed

Many trick finishes have come into use. Wrinkle is an old established item; crystal lacquers had a vogue, disappeared and are re-emerging. Hammer-type finishes, first obtained by spattering a solvent over a properly formulated enamel but now made so as to give the effect in one application, are having a contemporary boom. Crackle lacquer was one of the big items in the 1920's; today it is scarcely seen, although it had many interesting variations as an ornamental finish. It might reappear overnight.

Demand for Speed in Finishing Has Been Met

Speed and more speed seems to have been the slogan over these 25 years. From the 17-day auto finish, based on rubbing and finishing varnishes, to the few hours for lacquer, we have gone to alkyd-

"Regarding your November issue—your 25th anniversary issue—I wish to drop you this line of congratulations. I am sure there must be a great deal of satisfaction in reflecting on your 25 years of conscientious contribution to the finishing industry." — *Harold P. Ransburg, Ransburg Electro-Coating Corp.*

It's the INSIDE of a Washer That Takes the Real Beating!

Outside appearance is important to a washer . . . but the *inside* finish—the *working* surface—is even more important! It's the *inside* of the tub that takes the beating from steaming water, soaps, acids, greases, bleaches . . . from buttons and buckles that chip and scratch.

DURANITE-H approaches all the best qualities of porcelain . . . is *superior to porcelain* in impact-resistance, adhesion, flexibility, and economy.

DURANITE-H stands up to outdoor weather . . . is extremely resistant to heat, humidity, salt spray.

DURANITE-H is applicable over steel, aluminum, magnesium for a gleaming finish that takes the toughest treatment.

DURANITE-H has primary advantages that are apparent. In addition, it has scientifically developed qualities for specific products that can be the solution to *your* particular problems. For more complete data, write us.

DURANITE-H used on the tub of Speed Queen Washer by Barlow & Seelig

ATLAS POWDER COMPANY

Industrial Finishes

Stamford, Conn. · North Chicago, Ill.

amine combinations that bake as rapidly as less than one minute. There are low temperature (150° F.) finishes for wood that bake hard and tough in one hour, while even oleoresinous varnishes and enamels—by using phenolic resins, tung and dehydrated castor oils and modern driers—have developed a new aspect of hard, rapid, thorough drying that was unbelievable some years ago.

Now various plastic raw materials, such as styrene, are being condensed with oils to make even more dramatically rapid-drying products, while such adjuncts as chlorinated rubber and ethyl cellulose have been used together with varnishes and alkyds to give spectacularly increased speed. Much of the credit for rapid production must be given to the development of infra-red baking which is now so common in industry.

Spraying paint on metal parts as conveyor carries them through a water curtain booth.

Other equipment that comes to mind includes the very interesting electrostatic spray and dip technique; heater equipment to reduce viscosity by increased temperature; vast improvements in conveyors; spray guns; cleaning technique, and chemical preparation of metal surfaces to take coatings properly.

Speculating on the future, if war should ever come again it is doubtful if camouflage paints will ever be carried to the same degree, since our penetrating electronic instruments, radar and the like, cannot be fooled by color—and it is conceivable that missiles will be sent on a predetermined navigation directional course that will not be distracted by any camouflage.

The war has contributed some permanent benefits to our industry. The need for toluol for TNT has created huge new plants that make it from petroleum; and this has reduced the dependence of the solvent user on the coal-tar product. The same procedure has brought large quantities of petroleum xylol to market; and a new process converts ortho-xylene to phthalic anhydride—the base of alkyds and plasticisers—and thus adds appreciably to the limited production available from coal-tar naphthalene. The war put zinc chromate primer, the polyvinyl butyral-phosphoric acid primers and flame-resistant paints to wide use and much of this will continue.

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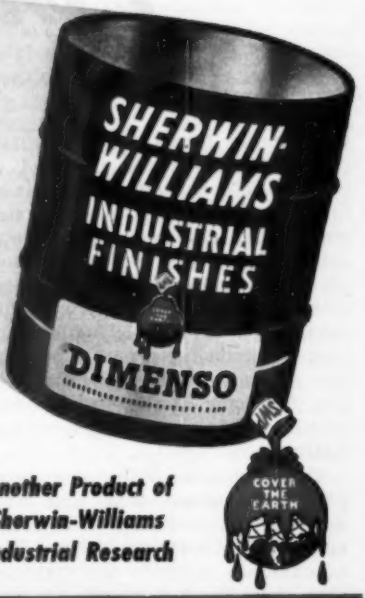

of realistic depth. You spray two colors simultaneously, from a single gun at one-third less cost.

You'll want full details on this amazing new lacquer. You'll want to know, too, about the standard baking line of DIMENSO finishes. Just mail the coupon for complete information. The Sherwin-Williams Co., Industrial Division, Cleveland 1, Ohio. (Export Division, Newark, N. J.)

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INDUSTRIAL FINISHES

Here it is—the material you asked for in your letter of Sept. 17—only there is two or three times as much as you asked for. Cut and prune it as you wish. I hope you will find just what you need in what I am enclosing.—

Rollin H. Wampler

Rollin H. Wampler

A QUARTER OF A CENTURY OF Production Finishing

By Rollin H. Wampler

WHEN INDUSTRIAL FINISHING Magazine was founded in 1924, the industrial division of the protective coatings industry was on the threshold of a revolution—or perhaps we should say, several revolutions. Until that time most industrial products were finished with materials which had changed little for generations. But the groundwork had already been laid for some of the developments which were to revolutionize product finishing.

Consider automobiles, for example. Until about that time they had been finished with primer, color coats, and clear varnishes. New automobiles were in the finishing shop for about a month or even longer. The advent of nitrocellulose lacquers reduced the finishing time from days to hours. Better yet, the finish held up better than the older oleoresinous varnish system. As lacquers were improved, the entire industry swung to them.

Lacquers and Baked Enamels for Automobiles

Improvements in pigments made colors almost as durable as black, so that the highways began to take on some of the color associated with them today. When commercial lacquer alkyds became available, they increased the gloss retention and general durability of automobile lacquers.

Early in the 1930's, the oven-drying type of alkyd enamels were introduced for automobiles. Prop-

erly baked, they kept finishing time at a minimum, reduced the number of coats required, and had the high gloss so desired for automobile finishes. They retained this gloss well, so that for the first time an automobile finish could be expected to last as long as the automobile. As they were improved and as spray equipment manufacturers developed new spray guns to handle these new enamels, it became possible to apply them so smoothly that no rubbing was required. This was another production advance.

Today both lacquers and alkyd enamels (with modifications) are used in finishing automobiles. Lacquers have been improved so that they will give good service for the life of the car.

White Enamels for Refrigerators, etc.

Refrigerators have undergone a similar transformation. The early white finishes discolored with age, soon lost their gloss, and stained. When lacquers came along, they not only speeded up the finishing process but also introduced new standards of color retention and resistance to staining. The development of modern titanium dioxide pigments made solid covering possible with only one or two coats.

When the alkyds came along, the industry switched to alkyd whites because they had even better color retention, and had good gloss and gloss retention. Today refrigerators are finished with white enamels based on combinations of alkyds with urea and melamine resins. The amine resins made possible very fast baking with little discoloration. The finish is almost as hard as vitreous enamels, and the resistance to staining is much better than any of the older materials.

Furniture Finished With Lacquers; Synthetics

The finishing of furniture has undergone similar transformation, but with some significant differences. The transformation from lacquers to synthetic enamels in automobiles and refrigerators was made possible by baking, as well as by the availability of better materials. Baking a finish on wood is quite different from baking a finish on metal. Temperatures over 150° F. are hardly practical for industrial wood finishing. Baking temperatures in this range are termed force-drying, because (with some significant exception) little real chemical change occurs. For this reason, only one type of baking finish has come into any large-scale use for wood finishing—the urea-alkyd finish, catalyzed so that the urea will convert to the insoluble stage at temperatures practical for wood finishing.

When this magazine was founded, wood was stained with chemicals, with water stains based on dyes, and with oil and spirit stains based on dyes. The oil and spirit stains have largely disappeared from commercial use because better materials are available.

Non-Grain-Raising Stains Fast-Drying Fillers

The present day non-grain-raising stains first came on the market some 15 years ago. They are as permanent as the best older mate-

rials, do not bleed into topcoats, and reduce the labor of finishing. Modern pigment wiping stains have gone through a period of evolution rather than revolution. They have been used for a long time, but the newer materials are better in most respects.

Until the last few years no significant improvement in wood fillers was made, other than slight improvements in drying speed. After a great deal of study and experimenting, it was found that wood fillers could be made that would be ready for recoating in as little as 30 minutes. While these newer materials have by no means taken over the entire field, they have now found an important place in wood finishing.

Similarly, pigment wiping stains are made which can be coated in 30 minutes, and are finding commercial acceptance. Combinations of non-grain-raising stains and 30-minute fillers are being used for one-shot staining and filling of some types of cabinet work, especially radio cabinets.

Improved Materials Helped Finishing of Furniture

In spite of the inroads of the urea-alkyd furniture finish, lacquers and oleoresinous varnishes still dominate the field. Lacquer sealer is almost universally used for the sealing coat, replacing shellac, substitute shellac, pigment first coaters, etc. Shellac still has an important place in wood finishing.

The best modern wood lacquers are vastly superior in cold-check resistance to the older lacquers. Their solids or non-volatile content at spraying consistency has been increased from 12% and 15% to 25%, 27%, 30%, and even more. Research in varnishes has kept pace, and today's furniture varnishes are not only faster-drying; they are better in many respects than the older materials. The force-drying technique is being used on all types of wood finishes.

Finishing on Conveyors Calls for Fast Drying

All industrial finishes have improved in drying speed and quality in the past quarter century. Improvement in application techniques has been as significant. In many of today's factories the products are finished on conveyor lines. The product may never stop from the time it is completely fabricated until it finally comes to rest in its carton or crate.

Spraying—Automatic and Electrostatic

The technique and apparatus for spraying have been enormously improved in the last quarter century. Electrostatic detearing and electrostatic spraying have appeared. Roller coating has come into use for some types of work. Dipping is preferred for some other types of work. Electrostatic and induction high-frequency heating may make some inroads on convection and radiant energy baking in the next few years. In looking back, it must be remembered that the developments we have mentioned are continuing, so that when INDUSTRIAL FINISHING reaches its fiftieth anniversary the picture will be quite different than what it is today.

Electrostatic Spraying

ELECTROSTATIC spraying is one of the really new developments that occurred long after INDUSTRIAL FINISHING Magazine was started. Those who have read the publication carefully during the past ten years should be thoroughly familiar with electrostatic spraying, as it has been publicized and illustrated in both the editorial and advertising pages. It is a system of spray painting wherein fewer spray guns are used and there is much less overspray. It is the means of providing a marked economy in spray painting products on a mass production basis.

The electrostatic part of it is the spray painting zone of action. This zone or area is highly charged with static electricity by means of suitable girds or electrodes, properly connected and placed. For products that hang from a single overhead chain conveyor, for example, the electrodes are positioned parallel and at each side of the path traveled by the articles to be painted.

Special adjustments are made in the material to be sprayed and the spray guns which do the work. First, the paint is correctly adjusted to atomize properly at a relatively low air pressure, frequently as low as 15-lbs. to 20-lbs. per square inch.

The solvent balance of the paint may need to be readjusted too, so that the paint particles will stay wet a little longer for successful electrostatic spraying. Spray guns are adjusted to properly atomize the paint at lower air pressure. Fluid pressure is reduced to less than what is customarily used for high-pressure spraying.

When spraying begins, the finely atomized particles of paint, coming from the spray guns in a gentle air stream of suspended paint fog, become ionized or charged with static electricity of the same polarity as the electrodes. This is of opposite polarity to the metal products moving along by conveyor. Instantly those electrically charged paint particles from the spray guns are attracted to the metal products within the electrostatic spraying zone. As a result, wet paint is deposited smoothly and uniformly over the rotating surface of the product being painted.

Performance of Sprayed Paint In Electrostatic Field

When such a setup is properly adjusted and balanced in every respect, most of the *paint that leaves the spray guns becomes useful paint film on the products being painted.* There is very little overspray. Paint particles, which other-

wise would miss the product being painted, become electrically charged and instantly change their course to fly to the metal surface that attracts them. As one item being painted moves beyond the zone of attraction, a following item moves forward to enter the zone—and electrically charged paint particles begin coating it.

By having a relatively low-pressure air stream carrying the wet paint particles, it is possible for the power of electrical attraction to be effective in drawing to the product being painted, most of the paint which otherwise would be spent as wasteful overspray. The small amount of paint that does escape this electrostatic attraction, and the evaporating solvent fumes, are exhausted through the regular spray booth exhaust system.

Variety of Products Can Be Electrostatically Sprayed

Naturally, the possibilities of this process are far-reaching. A great variety of parts and products can be economically spray painted in electrostatic zones. They can be suspended from overhead chain conveyors or moved through spray booths by other types of conveyors. Rotation or non-rotation of the object is determined by its size and general character. Such items as metal wastebaskets, radio tubes, automobile air filters, water-heater jackets, lamp shades and bases, and cylindrical containers of all types are rotated because their external symmetry readily permits such rotation, and increased efficiency of paint application is obtained by combining the merits of mechanical rotation with those of electrostatic attraction.

Such items as flat sheet stock, corrugated panels, cabinet panels (assembled or non-assembled), pipe of small diameter, Venetian blind slats and structural steel members can be coated either overall or on one side only, without rotation. They present to the electrostatic field and spray guns a flat extended surface which appears continuous as the separate parts move along by conveyor.

Still other irregularly shaped articles which are normally not visualized as possibilities for automatic spraying, can be coated by this method, because of the extended region over which coating material is attracted to the items. They can be rotated or not as the individual case demands.

Improvements in the Electrostatic System

Improved equipment and new techniques of application naturally followed the introduction of this system of finishing. Spray guns were developed especially for the process, incorporating fine atomization and wide fan-shaped spray at low pressure, designed to "drift" the paint fog into the field for even more efficient deposition. Sensitive individual fluid regulators were devised to provide the accurate paint

(Continued on page 76)

"Congratulations to INDUSTRIAL FINISHING Magazine on its 25th birthday. I hope this publication will continue to serve, as in the past, for a period that will enable it to celebrate its golden and diamond jubilees."
—*E. F. Frey, The DeVilbiss Co.*

How many objects in this office are finished with FERBERT-SCHORNDORFER products?
Only 14 objects in this picture have Ferbert-Schorndorfer fine finishes. But many manufacturers of office equipment have standardized on F-S finishes!
Wherever you turn—at the office, in the plant, on the street, at home, in stores—hundreds of the products you see wear fine Ferbert-Schorndorfer finishes.
Nowhere else can you find better technical skill and sound ability to solve your production finishing problems. A quarter century of service to industry brings a background of experience that can greatly benefit you.
For finishes *custom-formulated for your own particular production problems*—call on Ferbert-Schorndorfer.
You're bound to get exactly "right" finishes, in the right colors, at the *right price* from Ferbert-Schorndorfer. Find out NOW how F-S service and products can simplify your finishing problems. Write, phone, or wire!
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control necessary. An elaborate electronic control was devised and included in the system as a further safeguard to the equipment.

A new conception of usage arose, namely, the combination of hand spray for touching up deep recesses and areas shielded from the field. This is accomplished by simply adding a hand spray station, complete with its own booth, immediately following the electrostatic spray booth. In most cases, the electrostatic operator has sufficient time to perform what touching up is needed.

Electrostatic spraying has become a real production setup, applicable to hundreds of different articles where production volume is sufficient to justify straight-line, conveyorized handling. Almost any painting operation where reasonable volume is involved has potentials for the process.

Finishing Shares Spotlight At Metals Show

The 30th National Metal Exposition and Congress was held in Convention Halls, Philadelphia, Oct. 25 to 29, under sponsorship of the American Society For Metals. About a dozen of the 300 firms exhibiting were vitally concerned with better industrial finishes and finishing methods.

Some 40,000 of the nation's top manufacturers, executives, engineers, metallurgists and other industrial figures, along with their guests, thronged the five-day show. Naturally, progress in the creation of metal products has induced a similar progress in the development of better finishing of such metal products—hence interest was high as concerned finishing equipment and supplies exhibited.

Following are some of the various types of finishing equipment and supplies viewed and discussed by thousands during the show:

Infra-red equipment, including temperature recorders, controls and timers; safety devices; rust preventatives; emulsion cleaners; continuous conveyor oven with air heaters of recirculating type; various metal cleaners; automatic vapor degreasers, and rotary washers and dryers; solvent vapor degreasers; miniature scale model conveyor system; industrial wire cloth products, such as for washer belting; blast cleaning machine; and sundry other related items.

"I wish I could recall the start of INDUSTRIAL FINISHING, as you kindly remind me that our company was one of the first to heartily endorse your proffered service which would tackle, at the point of application, the problems of industrial decorative and protective coating.

"The steady growth of INDUSTRIAL FINISHING through 25 years with enlightening, educative and instructive editorial contents, and the increasing number of manufacturers of protective coatings who use your advertising pages, strongly attest to the wisdom of the good idea which brought about your beginning.

"You are doing an excellent job in your coverage of the broad field—from the manufacturer who uses but a few gallons a month of industrial finishes to those who use thousands of gallons per day; you have been liberal in the use of illustrations which tell their story cearly; you have not confined yourself to material prepared by your editorial staff, but have held your pages open to any manufacturer or user of protective coatings who had a story which you believed would be helpful to your readers.

"In being one of your earlier and steady advertisers, we feel we have been well repaid. It has been a pleasure to watch you keep abreast of the times and grow. We are sure this will be continued. Sincere wishes for your further growth."—*Carl J. Schumann, President, Hilo Varnish Corp.*

Simplified one-piece construction—all vulnerable moving parts protected—easily serviced and plenty tough.

The most important part of any spray gun is "the nozzle." Eclipse nozzles are not made of brass but of hardened steel, especially designed to take plenty of punishment and continue to give continuous top performance.

Do you want to reduce paint waste—paint faster and better—get a smoother finish, a brighter gloss?

Use Eclipse Spray Guns and Low Pressure Spray Equipment

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FINISHING HALLIBURTON

Aluminum Travel Cases

There is more to the finishing of aluminum travel cases than meets the eye. The cleaning and surface treating of metal parts are very important. All cases to be finished in colors are masked, sprayed, unmasked and baked.

By Fred M. Burt

ALUMINUM TRAVEL cases, as made by the manufacturing division of Erle P. Halliburton Co., Los Angeles, Calif., are produced in a satin finish (natural aluminum) and in five colors called Rio Red, Bermuda Blue, Miami Tan, Niagara Grey and Tahiti Green. Ten models range in size from a 5x9x12-in. ladies make-up case to the 8½x18x26-in. men's Pullman case.

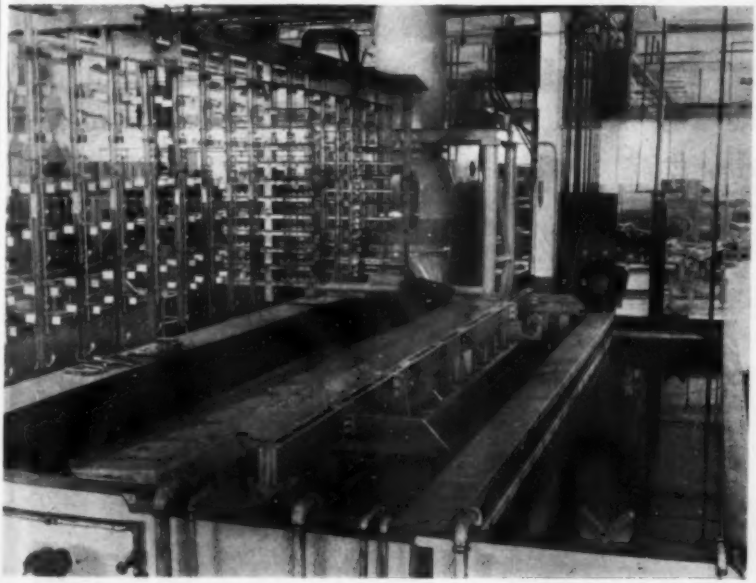
Aluminum alloy sheet stock, cut to proper size for top and bottom case shells and lubricated for drawing with a water-soluble oil, is drawn almost to full depth and size with a single stroke of a hydraulic press. Drawn shells are carried by overhead conveyor through a hot water spray rinse for removal of the drawing compound, and then through a heat-treating oven, followed by quenching in water. The shells are carried back to a second press for final forming; then they are moved to automatic trim saws to cut off the flash, followed by a careful de-burring and smoothing of all sharp edges.

Placed in conveyor baskets, the smooth shells travel through two large sets of sprays which hit them from all angles. First they are sprayed with a hot cleaning solution; then with a clear water rinse. Next comes a chromic acid preweld dip, followed by another hot water spray rinse and hot-air drying. The shells are now ready for one of several spot welding stations at which extruded aluminum male and female beads are welded to the respective shells. The female bead is later fitted with a live rubber seal to make the case weather tight, so it will keep out moisture, dust, mildew and insects.

At the automatic buffing machine there are 20 buffing stations where buffing wheels are mounted so as to buff the outside surfaces of each shell. There are four indexing stations where forms carrying the shells are automatically given a quarter turn for end buffing, and then a quarter turn back.

Next the buffed shells are precision-punched for hinges and locks. Then they are placed in the baskets of an overhead conveyor to be carried to the anodic department where they receive their Alumilite finish.

Aluminum shells are loaded on a large rack which has a capacity of 72 shells of any of the standard sizes. This load is moved crosswise over a series of tanks into which



Large dip tanks in which surfaces of aluminum shells are treated before finishing. At left, an empty rack appears above anodic tank. The adjoining tank is a cold water rinse.

it is lowered and lifted by a traveling electric hoist. A push-button control panel is used for actuating the forward, backward and vertical movements of the loaded rack. A picture of this rack and some of the tanks is included in this article.

The sequence of operations which a loaded rack of shells undergoes includes the following: 1) a 5-min-

Above: Masking the edges of pressed aluminum travel cases preparatory to spray painting.

Below: Spray-painting cases with a hammered-effect enamel; girl at left strips off the masking tape after completion of spraying. Note how conveyor moves in for loading.

FINISHING EQUIPMENT

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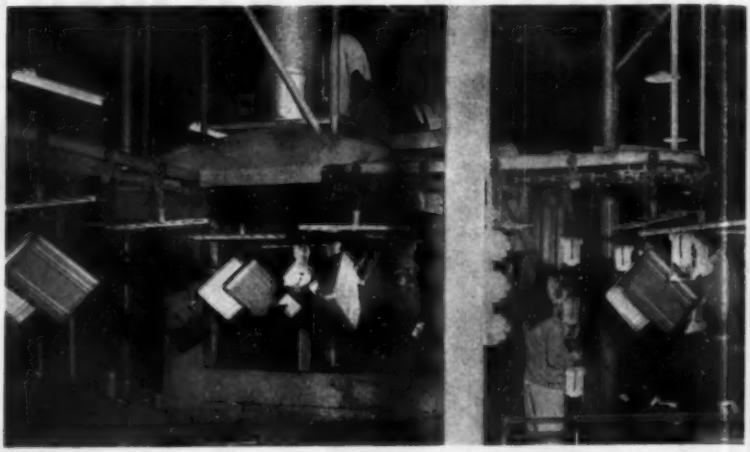

Loaded conveyor line where it enters and leaves the gas-fired convection oven.

ute soak in warm water to remove dirt or any remaining buffing compound; 2) a 4-minute caustic bath at 150° to 155° F. for a complete cleaning and slight etching of the surface (the shells come out of this tank black in color); 3) about a minute of rinsing; 4) anodic tank for 27 minutes, at the end of which time the electric current shuts off and an air horn signals.

The sulphuric acid solution and all other solutions are maintained at their required strength through daily titration. The acid solution is kept at a temperature of 68° F. Coming out of this last acid solution the aluminum shells are bright and shiny again.

The action of the anodic treatment on the aluminum surface—with application of an 18-volt electric current—forms a corrosion resistant coating on the surface; this is the satin finish. For cases that are to be finished in color, this anodic treatment provides an ideal surface to which the color enamel will adhere permanently.

At the end of the 27-minute dip in the anodic tank, the rack loaded with shells is moved again to the clear water rinse, and finally to another tank for 15 to 20 minutes of immersion in a low-acid solution at a temperature of 195° F.—this to close the pores in the aluminum metal surfaces. Following this treatment the shells are thoroughly dried and inspected. Shells to be made into satin-finish travel cases are now ready for assembly. Those to be finished in color are delivered to the Denman Metal Finishing Co., a local concern, for spray finishing.

Masking the Edges; Spray Painting

In preparation for spray painting, the edges of all shells are

This . . . may be just the cleaner you need

Oakite Composition No. 97 is a new emulsifiable solvent cleaner that dilutes with water for use in spray washing machines.

Oakite Composition No. 97 has proved its ability to remove buffing compounds . . . drawing and stamping compounds . . . cutting and grinding lubricants . . . mill and slushing oils and other rust-preventives . . . metal chips . . . and many other types of dirt.

Oakite Composition No. 97 is successfully washing steel, cast iron, brass, aluminum and zinc parts of all sizes and descriptions.

If you need . .

- faster, better cleaning *plus temporary rust prevention* between machining operations . . .
- or faster, better cleaning before certain prepaint treatments or organic finishing operations . . .
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you will want to ask the local Oakite Technical Service Representative about Oakite Composition No. 97. Telephone him today or write to Oakite Products, Inc., 32F Thames St., New York 6, N. Y.

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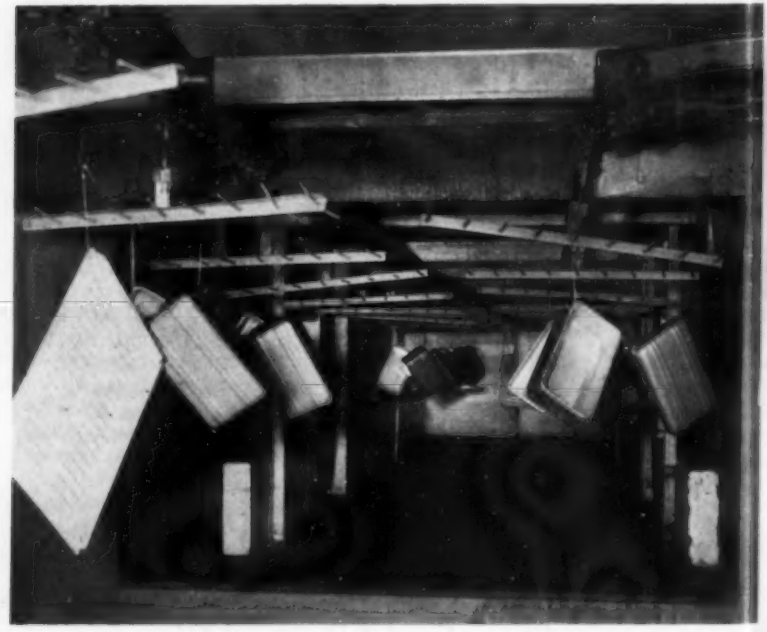
Specialized Industrial Cleaning

masked with narrow masking tape, as shown in one of the accompanying pictures. This masking and the subsequent coating are applied very soon after delivery, so that the surfaces will not become soiled or take on an undesirable oxide film because of exposure to the air.

The masked shells are placed on a paper-covered service table from which a sprayer's helper picks them up and places them on turntables in a water-wash spray booth.

Spray painting starts with a thin coat of special primer which dries quickly. Then follows a single spray coat of synthetic hammer-effect enamel. The enamel is formulated to certain specifications in the red, blue, tan, grey and green shades, and is delivered in 5-gallon cans ready for use. It is checked regularly, however, for viscosity with a Ford viscosity cup. If any thinning is required due to variations of humidity, temperature, etc., an aromatic solvent, toluene, is used.

With two helpers placing masked shells on turntables, stripping the masking tape after the finish is sprayed on, and hanging sprayed units on the overhead conveyor, the spray-painting operation proceeds at a rapid rate. All production pro-



A look into the convection oven wherein the overhead chain conveyor makes a U-turn.

sts in line?

It's everybody's problem these days! A complete review of your finishing materials and methods may help decisively. Your finishing costs, after all, go far beyond the cost per gallon of the finishing material itself . . . and can make a lot of difference in your *total* end-cost picture.

You can effect real savings . . . throughout your operations . . . with the right finishes, correctly applied. In factors like drying time, for example . . . or storage space, labor costs, percentage of rejects, and packaging operations.

Bring expert advice on finishing economies to *your* plant . . . by calling on Du Pont. Today, thousands of pre-tested formulas under the trade names "Duco" and "Dulux" are helping to keep manufacturers' end costs at a minimum.

FOREMEN, SUPERVISORS, EXECUTIVES: *If you have a finishing problem involving costs, performance . . . or a tough technical "bug" . . . write E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.*

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TTER FINISHES

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

cedures are set up in such a way that the more highly skilled workers have their work brought up and taken away by a conveyor or by helpers. As a result there is nothing to distract the skilled workmen from doing steady high-quality work on a mass production basis.

Spray painting is done in the first of two large spray booths, each of which is lighted by five 300-watt explosion proof and vapor proof lamps which are mounted above and directed down at the work. The conveyor chain, 8-ft. above the floor, carries hangers that have a relatively large capacity and which can be used to hold a wide variety of products.

Oven Baked "Hammer" Enamel in Color

The conveyor carries spray-painted work through a gas-fired convection oven (76-ft. of travel) wherein the enamel is baked at 300° F. for 30 minutes. For Halliburton travel cases the conveyor speed is set at 2½-ft. per minute.

On top of the oven two gas-fired heaters with blowers provide an adequate heat input which can be controlled by thermostats to within a plus or minus 5° of variation from the setting. If or when it is desirable, a temperature of up to 500° F. can be maintained in quantity production. The hot air is regulated to maintain an outward pressure in the oven. Hot air, directed inwardly from slots around the open end of the oven, provides an effective heat seal.

Consulting a qualified engineer in time will save costly errors.

High Solids in Wood Lacquer Sealers

THE PRIMARY purposes of a lacquer sealer are to seal off the suction of the wood so that subsequent coats will stay on top, and to provide a film which may be sand-papered down to a smooth surface. High-solids sealers are no better for these purposes than low-solids materials.

Many users of finishing materials expect lacquer sealer to provide, in addition, so-called "building" properties, that is, the coat of sealer is expected to provide a substantial film thickness so that the final coats will show fullness and gloss. Of course, high-solids sealers do contribute to fullness. But they do this at the expense of toughness, mar-resistance, and even cold-crack resistance.

All of the desirable properties of a good topcoat cannot be incorporated into a lacquer sealer. To increase the film thickness of the sealer unduly by increasing its solids content, will result in a sacrifice of some of the desirable properties of the final coats, no matter how high the quality of these final coats.

It is far better practice to increase the solids of the final coats if necessary for good build, and keep the sealer film as thin as practicable. The writer believes that 15% or 18% solids is best for sealers to be used under lacquers and synthetics, and 12% to 15% for use under varnishes. —ROLLIN H. WAMPLER.

"Permit us to congratulate you on your 25th Anniversary. We think you have done a splendid job and appreciate very much the cooperation you have given us through the years." —*The Mearl Corporation, H. E. Mattin, President.*

The perfection finish
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STANDARD *Selects Egyptian*

That desire for precision and perfection which controls every operation in the manufacture of Standard Electric Time Company's custom-built electrical testing instruments, extends even to the choice of a finish.

Standard's choice is Egyptian, not alone for attention arresting appearance, but for the immensely practical reasons of durability and protection.

The high quality of Egyptian finishes assures complete satisfaction wherever utilized as a finish for metal or wood products.

Circuit breaker calibration bench, custom-built for a leading manufacturer of electrical equipment. "Standard" manufactures many types of specialized laboratory electrical distribution and test panels, and precision timing equipment.

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PAINTING PRODUCTS IN A *Custom Shop*

Superintendent of H. S. Products Finishing Corp., Brooklyn, N.Y., describes and illustrates the methods, and equipment required for surface preparation and painting of new products in a custom shop.

By R. H. Sprague

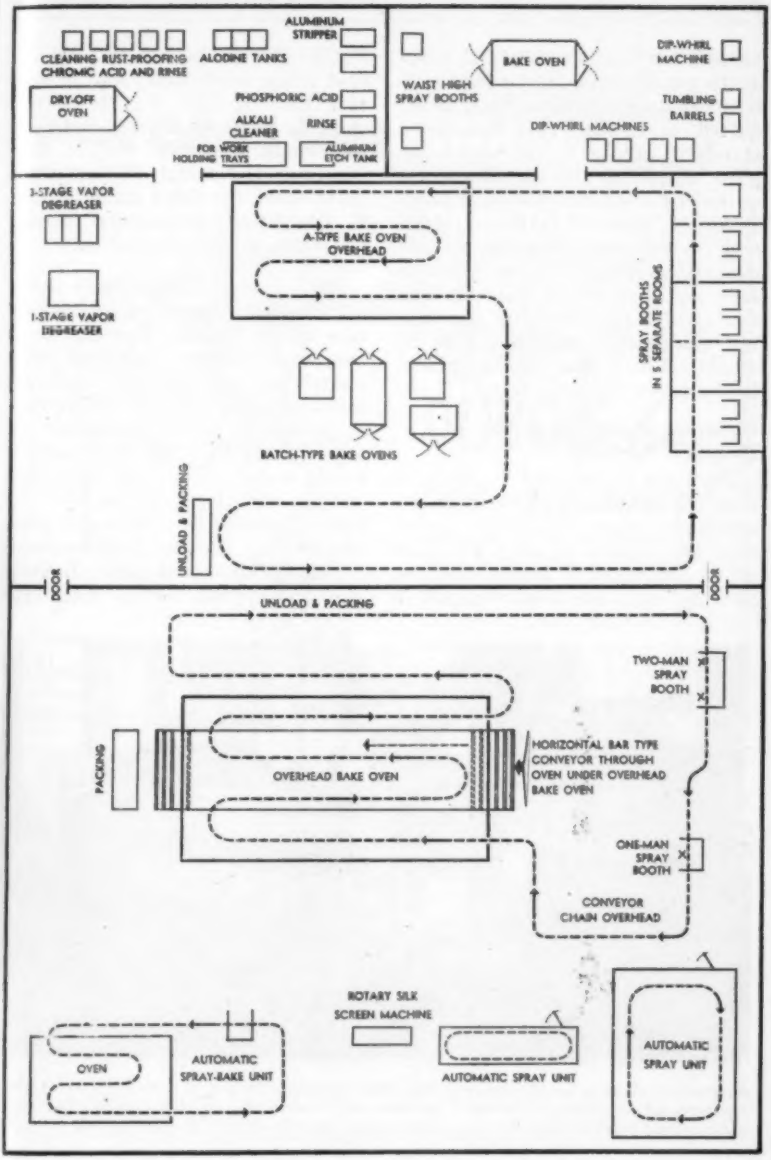
IN A CUSTOM SHOP, flexibility of methods and equipment are necessary to satisfactorily apply protective and decorative finishes on various products. These products comprise a wide variety from bobby pins to binoculars, from compacts to cameras, and ball point pen caps to soft drink dispensers. Large pieces are finished too, for example, 33-mm. movie projectors, radio transmitting and thermatron cabinets. Then there are wood items, knobs, buttons, etc., which must be tumbled or sprayed.

Complete Metal Cleaning Equipment is Required

In handling many different products made of various metals, some of which are coated with light or heavy drawing compounds, oils and

(Continued on page 94)

Various products coated in spray booths located in any of the five separate rooms, are hung on this overhead conveyor which carries them into and through a baking oven. Products are sprayed and then hung to the conveyor by the operator.

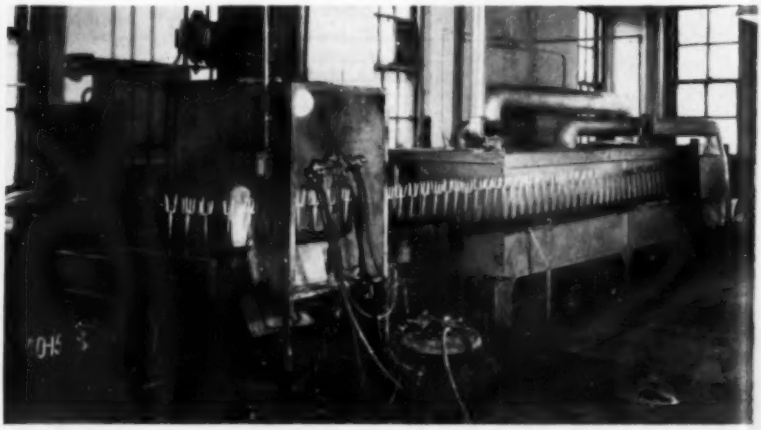

ALUMINUM STRIPPER
CLEANING RUST-PROOFING CHROMIC ACID AND RINSE
ALODINE TANKS
DRY-OFF OVEN
PHOSPHORIC ACID
ALKALI CLEANER
RINSE
FOR WORK HOLDING TRAYS
ALUMINUM ETCH TANK
WAIST HIGH SPRAY BOOTHS
BAKE OVEN
DIP-WHIRL MACHINE
TUMBLING BARRELS
DIP-WHIRL MACHINES
3-STAGE VAPOR DEGREASER
1-STAGE VAPOR DEGREASER
A-TYPE BAKE OVEN OVERHEAD
SPRAY BOOTHS IN 5 SEPARATE ROOMS
BATCH-TYPE BAKE OVENS
UNLOAD & PACKING
DOOR
DOOR
UNLOAD & PACKING
TWO-MAN SPRAY BOOTH
PACKING
OVERHEAD BAKE OVEN
HORIZONTAL BAR TYPE CONVEYOR THROUGH OVEN UNDER OVERHEAD BAKE OVEN
ONE-MAN SPRAY BOOTH
CONVEYOR CHAIN OVERHEAD
ROTARY SILK SCREEN MACHINE
OVEN
AUTOMATIC SPRAY-BAKE UNIT
AUTOMATIC SPRAY UNIT
AUTOMATIC SPRAY UNIT

grease, surface cleaning and preparation equipment must necessarily be more comprehensive than is required in a shop that handles a standard product. The same applies to all of the equipment required by a custom finishing shop. Products made of various metals and in different sizes, shapes and quantities—these factors have an influence on the type, quantity and size of cleaning, finishing and baking equipment required. For example, let us look at the equipment in the metal cleaning room.

Cleaning Equipment to Prepare Surfaces

Products coated with light oil or drawing compound go through the one-stage vapor degreaser; those that are shaped so they will hold oil or compound in bends, crevices, pockets, etc., are sent through a 3-stage vapor degreaser. In the first stage trichlorethylene is kept at a heat of 212° F.; the second stage is virtually a rinse with the same material at 110° F. The rinsing cools the metal so that when parts enter the third stage at 188° F., the vapor will condense to complete the cleaning operation.

Steel products coated with heavy oil, grease or compound are cleaned in a series of tanks serviced by an overhead monorail equipped with electric hoists. The first tank contains an alkali cleaner with emulsion added; it is maintained at 190° to 200° F. The next tank is a cold water rinse. The third is a rust-proofing treatment at 190° F.; this is followed by a hot water rinse at 190° F.; the last tank contains a mild chromic acid rinse. Baskets are transferred to a batch-type



Automatic spraying and baking unit for small products. In this picture four pencil caps are mounted on each spindle which revolves as it passes through spray booth. Two spray guns in fixed position coat the caps. The baking oven is at right in background.

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STRYPP —an excellent paint stripper . . cuts old paint deposits from booths quickly and easily.

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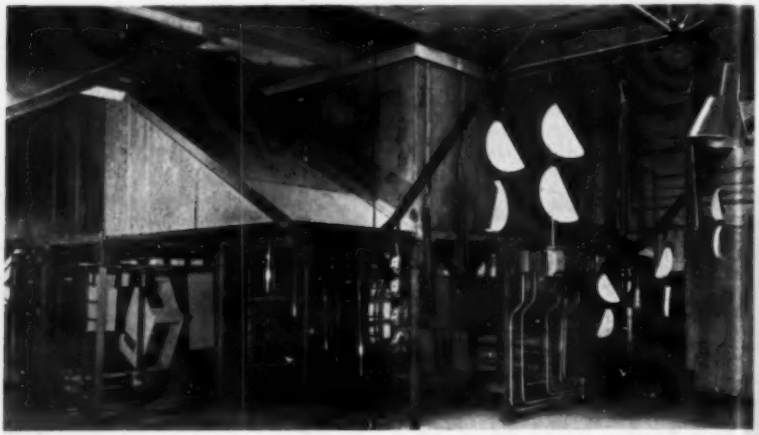

Overhead A-type oven in room No. 2. Various kinds of coated products enter this oven on the far side; baked products leave on the near side. Any degree of heat up to 425° F. can be maintained in the oven. A variable conveyor speed controls the baking time.

dry-off oven where all moisture is removed. Because of the wide variety of products, conveyorized cleaning and drying are impractical.

Other equipment in this room includes Alodine tanks, aluminum stripper and rinse, phosphoric acid bath and rinse for the etching of aluminum surfaces.

Small Parts, Sprayed, Whirled and Tumbled

The small parts finishing room contains two waist-high spray booths, three dip-whirl (centrifugal) machines, four tumbling barrels and a large batch-type oven. The work here includes finishing of shoe heel braces, bobby pins and upholstery tacks. After going through the metal cleaning operations these small items are placed in the work basket of a dip-whirl machine where they are dipped into either black or brown whirling enamel mixed half and half with solvent. Then the enamel pan is lowered and the basket is whirled clockwise for five seconds, then counter-clockwise for five seconds, this reverse whirling to prevent any tendency of the small parts to nest or cling together.

The coated pieces are poured into wire mesh trays and moved into an oven where they are baked for 30 minutes at 325° F. After cooling, the operation is repeated, followed by another baking period of one hour at 400° F.

Those metal products which would nest together—also the wood handles and knobs—are finished in tumbling barrels. These barrels revolve at 30-rpm. The coating material used for tumbling is enamel or lacquer, either clear or pigmented, and mixed the same as for

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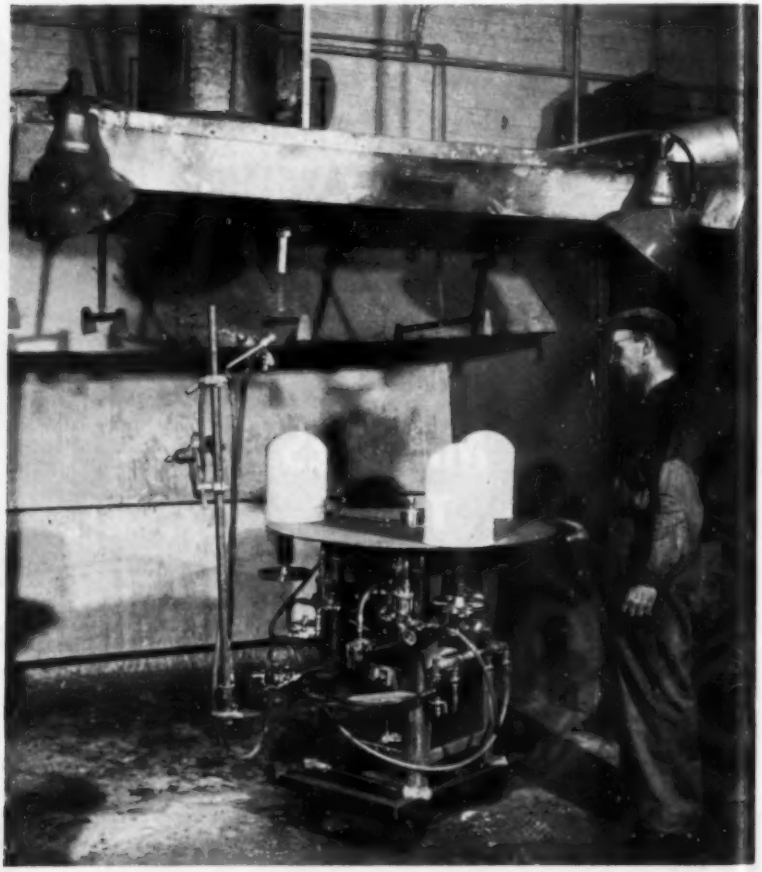
dip-whirl finishing. Enamel coated metal parts are baked. Lacquered or enamel coated wood products are air dried.

Small items that require spray finishing are generally placed on wire screens for coating; then follows either baking in the oven or air drying, depending upon the type of material applied.

Another finishing room included in our plant contains five separate



A portable automatic spray unit which is used for painting the dispensers white all over. The turntable rotates clockwise; each dispenser revolves while it is being sprayed. The conveyor chain above carries painted dispensers to the oven for baking the finish.

TAKE A TIP and get better acquainted with *Vedoc* finishes, an outstanding line of *organic* industrial coatings. All *Vedoc* finishes are developed for a specific use, then slightly varied to best fit each customer's production setup. Let us tell you more about them!

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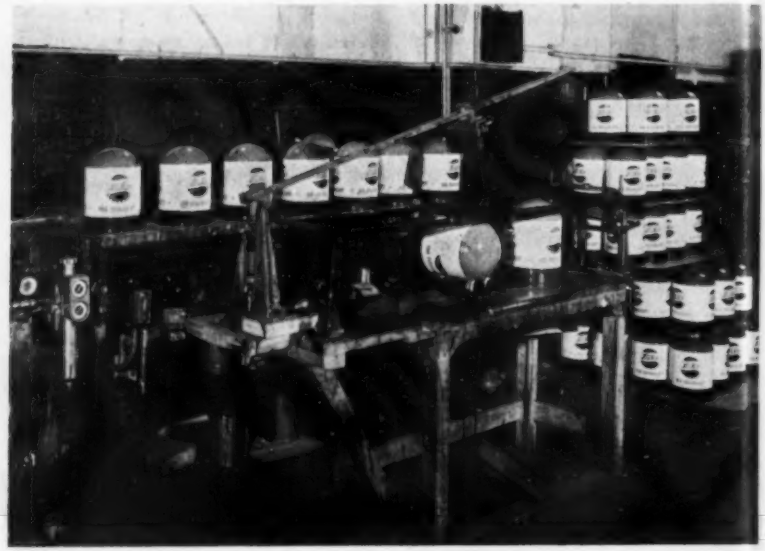


A rotary silk screen machine which prints three 2-color designs in two operations. The screen frame moves from right to left as the mounted dispenser is rotated mechanically.

spray rooms with a total of seven booths, all serviced by an overhead chain conveyor which carries various coated products from these booths to an A-type overhead oven. Also in this room are four batch type ovens which are used for products requiring a different baking period or temperature from that being used in the conveyorized oven.

Our third finishing room has a 2-man spray booth, a 1-man spray booth, and one automatic spray unit, all served by an overhead chain conveyor. The conveyor travels through an overhead oven under which another part of the oven bakes the enamel on parts which hang from a crossbar type of conveyor. This lower level oven is used for the larger products.

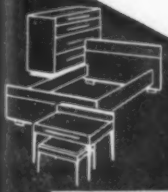
Two automatic spraying-baking setups and a rotary silk-screen machine are also located in this room. The automatic spray-bake units are used for pen and pencil caps and other small products made of metal or wood or plastic.

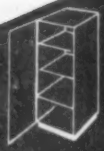
A typical example of products finished in this third room is the soft-drink dispenser. I have selected this product because it is finished on a portable automatic spraying unit and has a silk-screen decoration.

These dispensers are made of aluminum. After going through the

DURO-COTE AIR DRY ENAMEL

GIVES YOU SUPERIOR COLOR RETENTION AND HIGH BUILD!





The history of DURO-COTE is filled with successes where other enamels have failed. Exceptionally tough — high in surface resistance — DURO-COTE is giving manufacturers of kitchen cabinets, refrigerators, furniture, fixtures — yes, and toilet seats, all they've hoped for in durability and colorful sales appeal.

No matter what may be YOUR PRODUCT — if conditions require Air Dry Enamel — investigate DURO-COTE. The chances are DURO-COTE is what YOUR PRODUCT NEEDS!

DURO-COTE can be formulated for severest outdoor exposure.

Available in White and ANY COLOR in gloss, semi-gloss, or satin sheen. *Write for Your Sample Panel and Detailed Information.*

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Manufacturers of Enamels and Lacquers for over 50 years

vapor degreaser and Alodine tanks (where the surfaces are etched) the dispenser is mounted on a holder attached to the turntable of a portable automatic spray unit which is positioned in one of the spray booths. The turntable revolves clockwise, and as the dispenser comes within range of two fixed spray guns it (the dispenser) is mechanically revolved so that it becomes coated on all sides as well as on the dome-shaped top.

There are three stops or stations where the turntable becomes stationary. This makes it possible to load a dispenser on a holder and remove a finished dispenser while one is being sprayed.

Finished dispensers are hung on the conveyor which carries them through an oven where the finish is baked for 30-minutes at 275° F. When the dispensers return by conveyor, an operator fastens a close fitting metal mask around the center section of each dispenser; then red enamel is sprayed on the dome-shaped top, and blue enamel on the lower section. Again they go through the oven for a bake similar to the white coat.

After the red and blue coats are baked the dispensers are removed from the conveyor at the silk-screen printing machine. Here a dispenser is mounted on a holder, in horizontal position directly under the screen frame. On this machine the squeegee, which is mounted on a movable arm (that is to say, the arm is movable in a vertical plane) remains stationary as the screen frame is moved from right to left.

The dispenser, mounted on its holder, revolves counter-clockwise, motivated by the motion of the screen frame as it moves from right to left. With the squeegee lowered to an operating position, and stationary, the screen enamel is moved over the screen from left to right.

Silk-Screen Stenciling Design in Color

As a result, the designs and lettering are printed on the curved surface of the dispenser while it revolves. This design is in red and blue. After the red has been screened on, dispensers are allowed to air dry overnight. Then the blue stencil screen is fitted to the machine, the register of colors is checked, and the finished designs are completed. Again they air dry overnight before they are ready to be packed for shipment.

"The writer wants to take this opportunity of extending sincere congratulations to INDUSTRIAL FINISHING on its Twenty-fifth Anniversary.

"Our company has been privileged to be listed among your advertisers in every issue for the past 24 years and during the entire time we have read every issue of your publication with special interest.

"We feel that INDUSTRIAL FINISHING plays a very important part in the industry and serves a much needed purpose.

"We take this opportunity to extend best wishes for your continued success and to again congratulate you on the excellent job you have done during the past quarter century."—*V. J. Dolan, President, V. J. Dolan & Co., Inc.*

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UNITED High Speed Lacquers have been **tried, tested** and **proved** superior by manufacturers. In gloss, satin or dull finishes they're absolutely uniform in quality and performance. Every standard formulation is **time** tested for durability.

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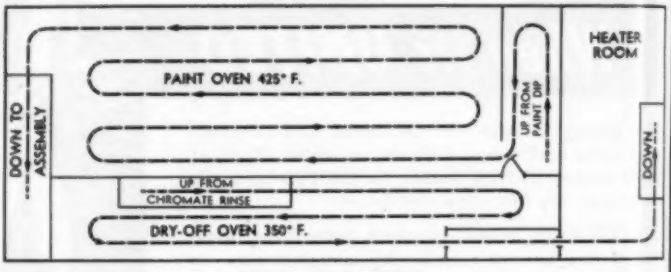
SPECIAL COATINGS

hung facing in the same direction, at a slight angle, with the open end down.

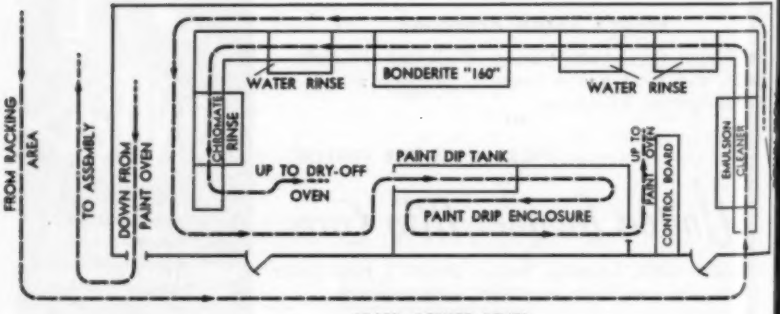
Much thought and study were given to developing adequate cleaning and surface treatment for the inside metal surfaces, so that these products would enter and move through the enamel in the tank properly to insure complete coverage; and finally obtain complete and thorough drainage of the surface-treating solutions and enamel.

As these products enter the washer an emulsion cleaner heated to 150° F. is sprayed over them. Spray heads inside the washer operate at 20-lbs. pressure and are located so that both the inside and outside surfaces of projectors are treated. The second and third stages consist of two hot water rinses, the first one at 150° F., and the second at 160° F. Next comes a Bonderizing solution which is sprayed over the work at 160° F., followed by a cold water rinse. In the sixth stage, phosphoric-chromic acid is sprayed at 160° F. Time in the washer is only nine minutes.

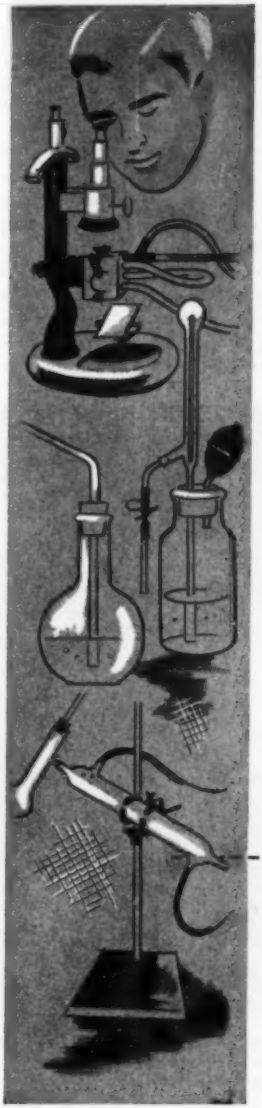
Just beyond the exit end of the washer the conveyor rises to the



PLAN—UPPER LEVEL



PLAN—LOWER LEVEL



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SINCE 1875 O'Brien research chemists have been busy developing fine Industrial Finishes, to meet all kinds of specifications. O'Brien paint chemistry has changed many time-honored formulae, has contributed to the improvement of a wide variety of Industrial Finishes. Each O'Brien product is not only laboratory-compounded to do a very specific and economical job; it is work-tested, under conditions more rigid than it will meet in actual use. Whatever your product, O'Brien know-how can be of benefit to you. The O'Brien Corporation, South Bend 21, Indiana.

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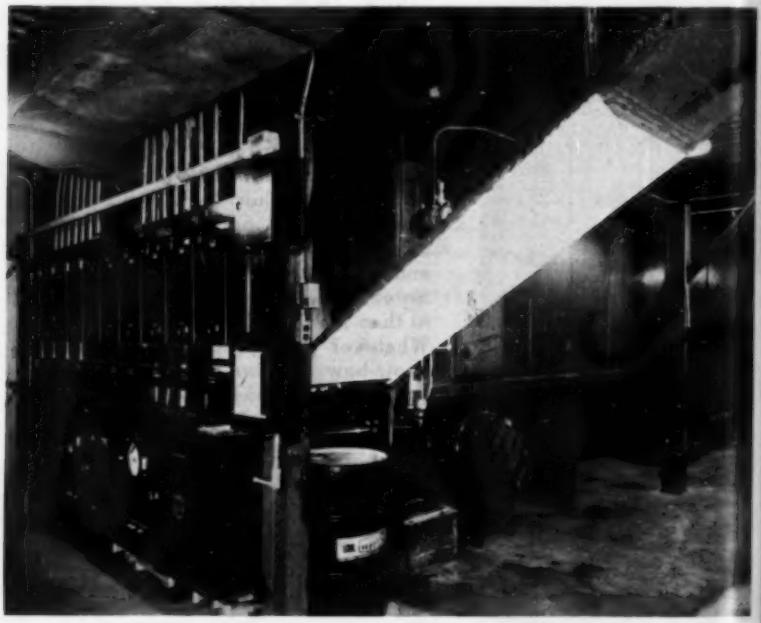
second floor which, as may be seen in the accompanying floor plan, contains both dry-off and baking ovens. Horn parts remain in the dry-off oven ten minutes at 350° F. It should be remembered that due to the shape of the projectors, domes and brackets, adequate time must be allowed to thoroughly evaporate all water which may be trapped by any cup-shaped surfaces.

Dip Finish Is Baked

Leaving the dry-off oven a cooling period of 15 minutes is allowed as parts travel through the heater room, descend to the first floor and travel along parallel to and outside of the 6-stage washer to the dip tank. This 1000-gallon dip tank, along with the drip pans, is completely enclosed by metal. It is protected by an automatic carbon dioxide fire-extinguisher system.

Paint in the dip tank is agitated by means of a pump. It is pumped from the bottom of the tank, forced through an all-metal filter, then released into the tank through a perforated pipe at the entrance end, at solution level. This inlet location keeps the top surface of



Central control panel which operates the surface preparation and dip-coating system. Oven temperatures are recorded here. Note conveyor chain lubricator just back of the 45° angle drip pan, over which horns are conveyed to the baking oven on floor above.

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Many leading manufacturers depend upon Randolph for quality finishes at low cost and quick service. Our representatives are trained to give reliable and practical technical advice to help solve your finishing problems. This service is available without cost or obligation to you.

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the paint free from the scum of dirt and oxidized paint. In case of an emergency, there is an automatic release valve for quickly dumping the enamel, through 6-in. pipe, into an underground pit. The conveyor bends down to completely submerge the parts in a specially formulated, black synthetic enamel.

The coating material we use is the result of some 14 months investigation, conducted in conjunction with manufacturers of organic finishes, to obtain a material that would satisfy all requirements as to looks, durability, uniformity, etc., on all the shapes of products. The coating will withstand better than 50 hours salt spray, even on sharp edges and seams.

During cold weather the enamel is applied at a viscosity of 20-seconds and, when necessary, it is thinned with toluol. During hot weather it is used at a viscosity of 17-seconds (No. 4 Ford cup) and is thinned with a blended reducer. After coming up from the enamel the dipped parts drain for eight minutes as they travel inside the enclosure. At the exit end of the dipping room the conveyor rises at a 45° angle to the second floor bake oven. Here the finish is baked for 18 minutes at 425° F. Parts cool as they travel to the assembly department.

Central Control Panel Operates Entire System

The entire surface preparation and paint dipping system (from pumps and fans to oven temperatures) is operated from one central control panel. Mounted on the side of the dip tank enclosure, just back of the control panel, is the automatic lubricator for the traction wheels of the conveyor chain. This hand-operated reservoir-type lubricator uses an oil that has a vehicle which flashes off at 350° F., leaving an oil film that will withstand a temperature of 450° F. The traction wheels are lubricated three times daily for 16 hours of operation. The same lubricant is used on the conveyor trolleys, chain and roller turns. However these points are lubricated only when daily inspections show the need, or about once every ten days to two weeks.

Mixing Equipment Co. Announces New Representative

Mixing Equipment Co., Rochester, N. Y., manufacturer of mixing and agitation equipment, announces the appointment of a new Virginia representative, the O'Neill Pump & Engineering Co. of Richmond.

T. C. O'Neill of O'Neill Pump & Engineering Co.

The O'Neill organization is expected to add substantial engineering know-how to Mixing Equipment's sales and service program. It will also make possible increased field assistance through more personal contacts with the company's customers and prospects in Virginia than has been possible from the New York City office which formerly handled this territory.

The new representative firm is headed by T. C. O'Neill, a native of Altoona, Pa., who holds an engineering degree from Lehigh University. During the war he served as section chief of the War Production Board.

A Remarkable, New Discovery of Vital Importance to Industrial Finishers

AT LAST it is possible to obtain a coating of straight Phenolic Resin (trade name: PHENOPLAST), the hardest of all common plastics, without resorting to baking or moulding. For PHENOPLAST, when brushed, sprayed or dipped on an object, produces an amazing baked-like finish that is harder and longer-lasting than any other surfacing and self-drying material known!

PHENOPLAST, when dry, is waterproof, gasoline-proof, alcohol-proof. It is heat-resistant; a fire-retardant; adds great strength to all laminated products. It is odorless, transparent, and carries a high gloss. PHENOPLAST may be used for coating wood, composition boards, plastics, asbestos, cardboard, plaster of Paris or steel—producing a lasting finish hitherto unequalled by paints or varnishes. It is also one of the most powerful adhesives known, for glueing or for COLD LAMINATING. Coated surfaces are impregnated and hardened, and are permanently sealed against moisture absorption.

It is particularly valuable as a hard high-class coating for

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Retail prices range from $2.50 a pint to $12.00 a gallon, with coverage on hardwood surfaces averaging about 600 sq. ft. to the gallon. Write for complete information to the PHENOPLAST CORPORATION, 331 Madison Avenue, New York, New York.

Several Excellent Territories Are Still Available to Qualified Representatives

Phenoplast*

THE 100% PHENOLIC RESIN THAT SETS AT ROOM TEMPERATURES

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SOME CAUSES OF Spotting IN WOOD FINISHING

By Rollin H. Wampler

Variations in texture of wood and grain, non-uniformity of corewood under veneer, wiped glue spots, pre-moistened or steamed areas, bleeding stain, uneven wash-coating, careless wiping of filler — anyone of these can cause an unpleasing spotty appearance in a finish.

PLEASING variations in pattern and texture are responsible for some of the charm of beautifully stained and finished wood. Stains accentuate natural variations in texture because of the different absorption characteristics of different areas in the wood.

End grain absorbs more stain and therefore becomes darker than areas where the wood fibers are parallel to the surface. This phenomenon accounts for the characteristic stripe of stained quartered mahogany, a wood that has interlocked grain. Every second or third growth band has some wood fibers that run at an angle to the surface, with the ends of the pores exposed. Such end grain becomes darker upon staining than the bands where the fibers are parallel to the surface, with the result that a characteristic stripe results.

Such highly figured woods as butt walnut and crotch mahogany have much end grain exposed, regardless of how it is cut. The differences in shade, after staining, accentuate or emphasize pattern.

Soft Textured Woods "Drink" in the Stain

Soft-textured woods will absorb more stain and become darker than a hard dense wood. For example, consider yellow pine and fir—woods which have differences in texture and density within each growth

Fast-to-light **COLOR** with clarity "SUPER" FILLING and durability

in *ONE QUICK* operation with . . .

RED X **DURAFILL** FUSION-TYPE FINISH

Non-fading, non-bleeding, clear deep colors are always attractive. Previous "combination fillers" have fallen short in these features.

DURAFILL "Fusion - Type" Finish has all these qualities in one product, because permanent dye stuffs and pigments have been combined in workable form for the first time. The desirable effects produced by water staining, wash coating, sanding and filling in separate operations are obtained merely by applying DURAFILL, padding in, wiping off and cleaning up. The color is clearer, the pores are filled more flush, top coats have more body and the finish is tougher and more durable because the entire finish is "fused" into one coat from the wood fibers up, through the application of sealer immediately after wiping.

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layer. The spring wood is light and soft; the summer wood is hard and dense. That is the reason why staining so emphasizes the pattern of plain-sawed or quartered pine or fir. Such patterns are not pleasing, as a rule, because they are too regular and too bold in contrast.

Unstained tupelo has little apparent figure. Judging from its appearance, one would think that staining would produce a uniform color, but this is far from what usually happens. Because the wood has strongly interlocked grain, staining often produces a spotty appearance which is undesirable on large panels—although for posts and trim in furniture the spotting is not so apparent. Most tupelo is subject to this spotting.

Woods that have interlocked grain may produce a pleasing or a spotty appearance upon staining, depending upon the species and how the lumber or veneer is cut. A knowledge of the finishing characteristics of different woods enables one to select species and cuts of lumber to avoid spottiness and unpleasing grain patterns.

The Stain to Use, and How to Use It

If the wood has a pleasing figure then it is desirable that the stain emphasize its pattern to the fullest extent. The stain used should be a dye-type material, such as water stain or non-grain-raising stain.

If the wood tends to produce unsightly spots, as it often does in popular or tupelo, then a pigment wiping stain should be used. This type of stain does not emphasize differences in texture; it has more of what is called "uniforming power". Thus, in applying an imitation walnut or mahogany finish on spotty woods, a pigment wiping stain will produce a more natural uniform color than a dye-type stain.

The method of putting on the stain has something to do with spotting tendencies. In general, the color obtained with water stains and non-grain-raising stains is more uniform if the stain is sprayed rather than brushed or dipped. The reason is that spraying deposits a relatively uniform quantity of stain on all areas, so that porous spots cannot "drink up" more stain than other places.

Brushing and dipping methods of staining permit the porous areas of the wood to fill up with all of the stain they can hold. This holds true only for the dye-type stains; it does not apply to pigment wiping stains, except to a limited extent.

Non-Uniform Corewood Causes Uneven Staining

I have pointed out two causes of spotty finishes, namely, choice of the lumber or veneer and application method. There are quite a number of others. One is defects in the corewood of veneered panels. Large knots in the corewood will often show through after the finish is on and rubbed, even though they could not be seen before staining. Likewise, holes and depressions in the corewood will often show up as dark spots on the veneer after staining. The reason is because in laying up the panel the veneer was compressed less over the low places, therefore such areas absorb more stain and become darker. *(to p. 116)*

Livability is enhanced by an atmosphere of culture and refinement.

. . . and fine finishes help immensely!

Radio cabinet, living room and bedroom furniture may reach the ultimate in design and workmanship but—it's the finish that gives these pieces their distinctiveness, reflecting that cheerful and cozy atmosphere so much desired.

Manufacturers who recognize the importance of finishing are on top today, selling more merchandise and commanding higher prices.

Stille-Young supplies many of these concerns with outstanding finishes—some standard, some formulated to special purposes.

For instance, there are standard all-purpose finishing materials in the Stille-Young line, or we will make for you any type of lacquer, sealer, stain or filler which your particular process may require.

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Manufacturers:
LACQUERS, FILLERS, STAINS, ENAMELS AND PAINTS

Rough planer marks on the corewood will also show through when the veneer is stained. On two occasions I have found this condition in production furniture finishing. No amount of sanding of the veneer will eliminate the trouble. The real cause occurred in the press, where the planer marks on the corewood were transferred to the veneer, producing such differences in density that stains would show them up.

Wiped-Off Glue Spots Hold Out Stain

Another cause of spotty wood finishes is the presence of glue spots on the surface of the wood. Drops of glue on the surface, if wiped off at once, may not leave noticeable spots. When stain is applied, however, every glue spot shows up as a light spot. The reason is because the wiped film of glue sealed the wood so that it would not absorb as much stain at that place.

It is possible now to locate wiped glue spots before staining by adding a fluorescing material to the glue. The unstained case is inspected under a special lamp. Wiped glue spots show up clearly, even though they can not be seen by ordinary light. Once the spots located, they can be removed much more easily than light spots in the stained surface can be corrected.

Any water spots on veneer may produce spotting when the surface is stained, even though the spots are thoroughly dry and leave no apparent mark on the wood itself. The reason is because contact with water expands the wood so that it absorbs stain more readily. Once part of a wood surface becomes wet before staining, the only way to make sure that no spotting will occur is to sponge the entire surface with water and, after it is dry, sand it carefully.

Wood Once Steamed or Wet "Drinks in" Stain

I recall of one instance where a waterfall curve on the top of a case was made by dampening the surface of the panel after saw kerfs had been made on the under side, to reduce the danger of damage to the veneer when the actual bend was made. Everone of the completed cases showed up considerably darker on the bends because of the water treatment on the surface before bending. The trouble was eliminated by sponging the entire panel before bending it.

In another case a chair manufacturer was making bent wood chairs by steam bending beechwood. He was staining with non-grain-raising stain. The stain was spotting badly on the curved or bent sections. This trouble was eliminated by changing to a pigment wiping stain. There seemed to be no practical way of getting a uniform color with dye-type stains because of the drastic changes made in the structure of the wood by steam bending.

Bleeding of Stain Can Cause Spotting Too

In the days when penetrating oil stains, based on oil-soluble dyes, were more widely used, spotting was often caused by bleeding of the dyes. Modern non-grain-raising

MAR-PROOF LACQUER

SCHAEFER'S Mar-Proof Lacquer is a performance-proven finish that cannot be easily marred or scratched.

It's tough—tougher than the ordinary lacquers; meets the most critical requirements of current production.

Made in either clear gloss rubbing or satin finish, it produces a splendid transparent coating of full depth on maple, walnut, gum, mahogany and other cabinet woods.

Economical; gives plenty of coverage and dries quickly. Our Mar-Proof Lacquer Sealer is recommended with it for a first-coater.

Working samples furnished without obligation. Write for them!

THE SCHAEFER VARNISH COMPANY, INC.
Louisville, Kentucky

stains and water stains have almost eliminated spotting from this cause.

Water stains will bleed little, if at all. Non-grain-raising stains may bleed if they are coated over too soon with lacquer. These stains contain small amounts of heavy dye solvents which carry the dye into the wood. If the surface is coated before this carrier has been completely absorbed, spotting may take place. Thirty to 60 minutes of air drying is usually adequate to prevent spotting from this cause.

Uneven Wash Coatings; Uneven Filler Wiping

Uneven wash coating may cause color streaks or spots. The function of the wash coat, which is a light coat of low-solids shellac or low-solids lacquer sealer, is to prevent excessive penetration of the filler vehicle into the wood, as well as to facilitate wiping of the filler. A wash coat holds the color clearer and lighter than if none were used. It is obvious, then, that the wash coat must be put on evenly if a reasonably uniform color, free of spots and streaks, is to be obtained. Careless spraying, particularly if the spraying pattern is split in the center, may cause streaking and spotting.

The proper technique in filling is important for a good finish. One frequent cause of spots is improper cleaning up of the filler. Where or when the filler is not wiped off clean, any smeared filler will show up as dark apaque spots in the final finish. If the filler becomes hard and is difficult to wipe off, dampen the wiping rags with VM&P naphtha. Do not use too much, however, or the filler will smear. Use just enough to dampen the rags slightly to the touch.

When sanding the wash coat, or when sanding the sealer coat, inexperienced operators may sand through the stain and thereby produce light spots. Make sure that the sanding is just enough to remove the protruding wood fibers, in the case of sanding the wash coat, or to cut off particles of dust and other foreign matter when sanding the sealer coat. Watch all corners and edges; it is easy to sand through at these places.

The experienced wood finisher will know of many other causes of spotty wood finishes which I have not mentioned in this short article. Those I have described are fairly common.

DuPont Chemicals Exhibited

The Chemical Specialties Section of the DuPont Co.'s Finishes Division announces that it will exhibit three new products at the Automotive Service Industries Show, on the Navy Pier, Chicago, December 6 to 10.

These new DuPont products, introduced after long research and extensive tests, are a fuel system anti-freeze, to prevent freezing of moisture in the fuel lines of an automobile or truck; a clear windshield sealer for stopping leaks at the windshield frame; and a non-flammable rug and upholstery cleaner. All are now available.

Lilly Paint Products Opens Warehouse in Dallas

Warehouse facilities in Dallas, Texas, to expedite service to customers in the southwestern part of the U. S., is announced by Lilly Paint Products, Inc., Indianapolis, Ind. This new facility makes possible quicker and more efficient delivery of paint and enamel to customers in that territory; and makes it possible to take advantage of carload freight rates, thereby permitting a substantial savings in the delivered price of paint and enamel to the customer.

Finishing our first hundred years in the finishing business — 1849–1949.

PRATT & LAMBERT-INC.
Industrial Finishes
NEW YORK BUFFALO CHICAGO
FORT ERIE, ONT.

"Hammered Effect" Enamel

Please enter our subscription to "Industrial Finishing". We are on the lookout for a "hammered finish enamel". If you have a list of advertisers making this or a similar finish, we would be glad to get a copy of it. We are manufacturing a portable air cooler for home and office use.—D.Mfg.Co.

Several hammered-effect finishes have been advertised in recent issues of this magazine. In a letter we are listing 10 or 12 firms that can supply such a material.—ED.

Gilsonite; Vermiculite?

Will you send to us the names of any manufacturers who make a gilsonite paint containing vermiculite? We understand that such a paint is on the market.—B. Mfg. Co.

In a letter we are naming concerns that might have what you want.—ED.

Tumbling Machine

Could you tell me where I could buy a machine for tumbling the burrs and flashes off small lead units that we mold? —W.S. (N.Y.)

Try Lupomatic Industries, 4510 Bullard Ave., New York 66, N. Y.—ED.

Finish for Wooden Boats

We manufacture wooden boats, 16-ft. and shorter lengths. These boats are made of western red cedar. We apply three coats of varnish on the inside and decks. This is comprised of one sealer coat, and two straight varnish coats.

The outside of the boats are given one coat of sealer, one coat of undercoater, and one coat of enamel. We must allow 24 hours drying time between the two coats. We are wondering whether or not you coud possibly suggest some type of finish, which could speed up our finishing work. Our finishing room temperature runs in the neighborhood of 75° to 80° F.

We need a finish that has high gloss and will take a lot of weather and water, yet low price also enters the picture too. Have you any suggestions?—T. Boat Co.

We believe this is something you should take up with one or more of the leading manufacturers of wood finishing materials, whose advertising you see in this magazine.

If you will invite the Technical Representative from one of these concerns to call and look over your exact shop conditions and the wood materials used, we feel sure that he can specify a suitable finish that will probably dry faster than the finish you are now using. In a letter we are suggesting the names of some of the representative companies.—ED.

Buffing Metal Tubing

We have a problem in buffing long lengths of tubing in our plant. We wonder whether you can give us an idea of how to build a machine using a number of buffing heads to handle these tubes. The diameters range from ¾ to 1¼-in. The lengths are from 3-ft. to 6-ft. We have heard of people making such machines for themselves, but have never ran across anyone making it as an item for sale.—P.N.W.

We are referring you to some of the concerns that make buffing wheels and buffing compounds. Perhaps they can help you or refer you to an engineer who might be interested in building such a machine.—ED.

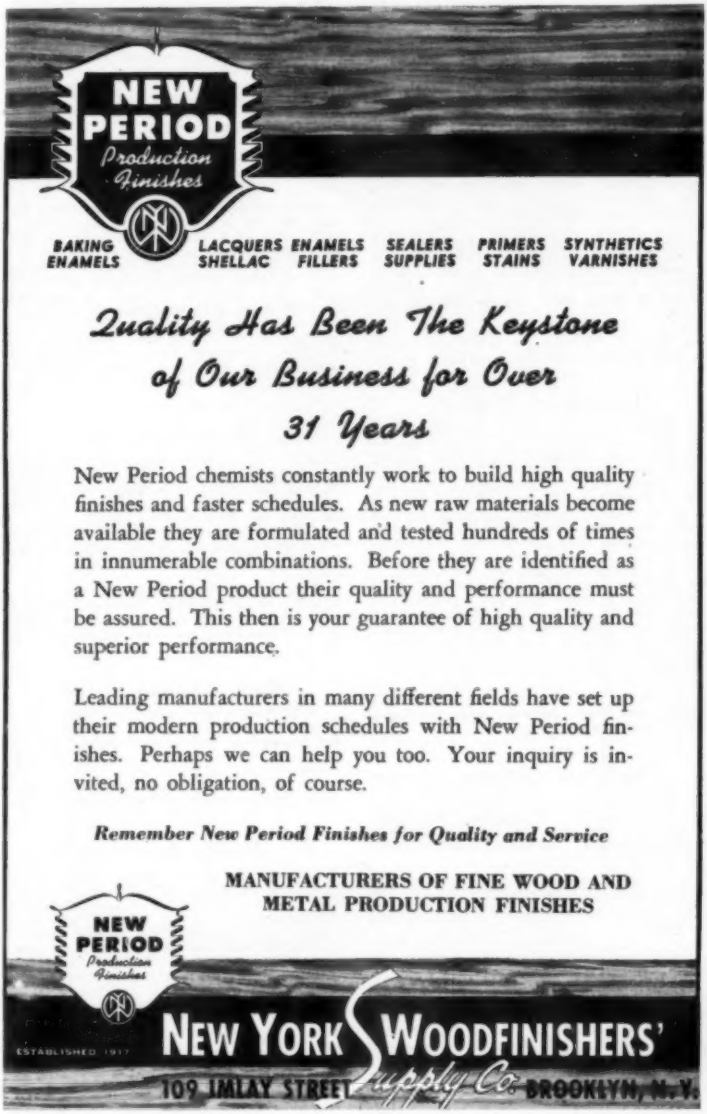
Rubber Squeegees Wanted

We obtained your address from Mr. J.F.H. van Eijnsbergen at Overveen, Holland. We need to get in touch with a supplier of rubber squeegees for silk-screen printing and we would be very much obliged if you could furnish us with an address of a firm who can deliver us these articles. — Grunstein's Metaalwarenfabriek, Amsterdam.

In a letter we are submitting the names of a few concerns who can supply what you want.—ED.

Aluminum Lacquer

In the Random Comment section of this magazine for September we saw a paragraph on page 88 referring to an aluminum lacquer that resembles certain types of plating. If at all possible please advise us the name of the manufacturer


NEW PERIOD
Production Finishes
BAKING ENAMELS
LACQUERS SHELLAC
ENAMELS FILLERS
SEALERS SUPPLIES
PRIMERS STAINS
SYNTHETICS VARNISHES
Quality Has Been The Keystone of Our Business for Over 31 Years
New Period chemists constantly work to build high quality finishes and faster schedules. As new raw materials become available they are formulated and tested hundreds of times in innumerable combinations. Before they are identified as a New Period product their quality and performance must be assured. This then is your guarantee of high quality and superior performance.
Leading manufacturers in many different fields have set up their modern production schedules with New Period finishes. Perhaps we can help you too. Your inquiry is invited, no obligation, of course.
Remember New Period Finishes for Quality and Service
MANUFACTURERS OF FINE WOOD AND METAL PRODUCTION FINISHES
NEW PERIOD
Production Finishes
ESTABLISHED 1917
NEW YORK WOODFINISHERS' Supply Co.
109 IMLAY STREET BROOKLYN, N. Y.

or distributor in the Chicago area or surrounding territory.—G. Products.

The author of Random Comment says the material is a product of Multi-Coat Corp., Bedford, Ohio.—ED.

"Plastic Metal"

Would you kindly send us the address of Plastic Coating Co., manufacturer of "Plastic Metal", mentioned on page 100 of the September issue of INDUSTRIAL FINISHING?—Rolscreen Co.

I notice on page 100 of September 1948 issue of INDUSTRIAL FINISHING, mention of a product called "Plastic Metal". Will you please forward us the address of the company making this repair metal?—B. Mfg. Co.

The firm's address is 6911 Stanford Ave., Los Angeles 1, Calif.—ED.

Finishes for Glass

We wish to apply a finish on glass items and wonder if you can advise us as to the best possible air-drying spray material to use to obtain a durable job.

Our particular project calls for applying a background coat plus a second coat of a different color over a portion thereof. Both will have to be high gloss. We understand that air-drying materials are available for this kind of work, but we do not know the sources for them.

We also understand there are materials on the market that will give practically ceramic results with a low baking temperature. We would appreciate very much if you could suggest manufacturers whom we could contact regarding both of these materials.—P.B.P.

In a letter we are naming about six concerns who, we believe, can probably supply what you want.—ED.

Ventilation Experts

Could you send me the names of one or more companies in the East that send real experts on ventilation and heating to manufacturing plants to solve organic vapor problems?—H.D.E.

Call on some of the firms you see advertising in this magazine—firms that supply spray booths, ovens, air filters, etc.—ED.

Flock Finishes

We notice in the September INDUSTRIAL FINISHING, under "Letters from Readers", that there are inquiries about Silk Screen Printing, Flock Finishes, and on Flock and Flock Adhesives.

If any of these three is in Canada or British Empire countries, we would appreciate your advice, so that we might get in touch with them, for we feel that we have a good deal to offer to such type of product buyers.—Scott's of Hamilton, Hamilton, Ont., Canada.

The three published inquiries all came from here in the state's—Maine, New York and Illinois.—ED.

Dipping Equipment

Perhaps you might be in position to assist us by furnishing the names and addresses of a few manufacturers of dipping equipment, perferably located in the East. We are considering the installation of such a department and believe that your staff will be in a position to furnish that information.—W.B.C.Co.

Try one or all of the following:
Magnus Chemical Co.....Garwood, N. J.
Apex Products Corp.....New York 11, N.Y.
Weber & Scher Mfg. Co.....Newark 7, N.J.

Blasto Spray Gun

In a recent issue of INDUSTRIAL FINISHING, there was an article describing the Blasto Spray Gun, which will sandblast and spray flock. Please mail the street address of the makers, as I have been unable to get any information about them from the local C. of C.—A.H.K., Santa Monica, Calif.

The illustrated write-up on this appeared in July 1948 issue of I.F., page 102. Address of firm, as given there, is 7007 Haas St., Los Angeles, Calif.—ED.

Roller Coating Machines

Will you pease advise where we may procure roller coat equipment suitable for applying paint or lacquer on sheets or strips of perforated metal?—H.D.E.

There are several. In a letter we are submitting names and addresses.—ED.

Shellac Article Liked

Somewhere in our files we have an interesting exchange of correspondence with Mr. Rollin Wampler about shellac and in your recent issue of INDUSTRIAL FINISHING for October we read with considerable interest his article on the use of shellac as a finishing material.

He points out what is sometimes overlooked, namely, that shellac still plays a very important part in the furniture industry, not only as a wash coat and sealer, but also as a component of many of the finer lacquers to build up their gloss, adhesion and flexibility. It has been gratifying to us this year to see so many prominent people in the furniture

FASTER FINISHING AT LESS COST

PUMP AND SPRAY FROM THE ORIGINAL CONTAINERS

1. Air-operated *Versatal* Pumps dispense materials directly from original drums . . . serve up to 6 spray heads.

2. Hydraulic pressures deliver materials through as much as 1000 feet of hose.

3. *Versatal* eliminates "time-out" for material handling and transferring . . . increases output per man hour.

For complete details write Alemite, 1814 Diversey Pkwy., Chicago 14, Ill.

ALEMITE *Versatal*

Another Product of Stewart-Warner

field reverting to the use of shellac once again, despite the high prices which still prevail.

We feel that Mr. Wampler has done his usual thorough and workmanlike job in covering shellac. The American Bleached Shellac Manufacturers Association is always engaged in research on shellac for various industrial uses. The next time we have conclusions of interest along finishing lines, both Mr. Wampler and your publication will be very much on our minds and we will see to it that our results are forwarded to you.

With many thanks for the nice word you had for shellac, we are, Yours very truly—William Zinsser & Co., Inc.,

Trick Finishes Wanted

We understand that in the July 1948 issue of INDUSTRIAL FINISHING, you published an article entitled, "Trick Finishes". One of our clients is particularly interested in this subject and has asked us to try and obtain a copy or, alternatively, set of tear sheets. Can you oblige?—S.&S. Ltd., London, England.

You are three years late. The article appeared in July 1945 issue of I.F. The article was very popular and we can find only one old copy of the magazine containing it. Tear sheets from this copy are being sent to you.—ED.

Who Knows Something About Marble Oil?

We shall appreciate very much any information which you may have on the product "Marble Oil", which is said to be used in the United States for natural finishes. We understand that this material is brushed on or flowed on to wooden surfaces with a blow torch and that it produces a hard glossy surface.—Technical Information Service.

We have no information about it at the moment. Can some reader help us on this?—ED.

For Cleaning Conveyor Hooks

I have read with interest the article, "Cleaning, Painting, Baking Setup in Small Space", which appeared in August 1948 issue, beginning on page 66. On page 68 of the article the author states that the conveyor hooks are cleaned between loading and unloading stations. Would you please advise us as to what kind of solution is used for removing the paint?—S. Clock Co.

In checking with the factory in question, we find that they originally used a lacquer thinner for cleaning their hangers. However, some time ago they changed to enamel and now they say that they are not able to clean the hangers simply by running them through the cleaning tank. As long as they used a lacquer, the lacquer worked out very nicely.

However, some of the concerns who advertise chemicals for cleaning metal or stripping off paint, in this magazine, can probably supply a material suitable for your purpose.—ED.

Home Freezer Cabinets

We would appreciate receiving tear sheets, if available, of the article "Finishing Home Freezer Cabinets" by J. R. Streeter that appeared in the July 1948 issue of your magazine.—T.A.I. Corp.

Request granted.—ED.

Drying Time Recorder

On page 4 of October 1948 issue of INDUSTRIAL FINISHING, you published an article under "Random Comment on the Industrial Scene", concerning a device known as a Circular Drying Time Recorder. We are interested in finding out who manufactures this device and other pertinent data.—J.D.A. Mfg. Co.

This device is manufactured and sold by Henry A. Gardner Laboratories, Inc., 4723 Elm St., Bethesda 14, Md.—ED.

Hutchison Now General Sales Manager of Sterling T. P. Co.

D. A. Hutchison has been named the general sales manager of Sterling Tool Products Co., manufacturer of portable

D. A. Hutchison, General Sales Mgr. for Sterling Tool Products Company

sanding machines, Chicago, Ill. Mr. Hutchison, formerly assistant sales manager, succeeds J. A. Proven who resigned recently.

H. P. Gangwer, comptroller, has been named vice president of the company.

Ablon

A CHAIN THAT MUST BE BROKEN

Each link in the chain of rising costs holds manufacturers in a dangerous and profitless prosperity. Here's how we hope to break a few links . . .

Believing that a down-trend in raw materials costs is long overdue, we voluntarily make our contribution—in anticipation — in order to relieve the straining costs of our customers' finishing operations.

Currently we are furnishing our customers with the finest in short-bake *Ablonite Synthetics* at worthwhile savings. We take this first step backwards towards saner pricing to help our customers successfully attack their excessively high production costs.

ABLON
Finishes Incorporated
EXCELLENT SYNTHETIC and WOOD FINISHES
84 Waydell Street • Newark 5, New Jersey

More About Heating That Shop

Regarding the question of "Heating Shop in Which Exhaust Fan Operates" (IF, August, p. 96 and IF, October, p. 102), the L. I. Co. can gain back much of the heat which the exhaust fan takes out if the duct be carefully sealed inside a second duct, through which intake air is drawn.

The exhaust duct can be made up of rolled sheet metal and either soldered or brazed to insure against leakage of fumes into the return tube. This latter need not be made as tight as the exhaust tube, but should be insulated with magnesia or one of the other low-heat-loss materials so as to conserve as much of the regained heat as possible.

If, as is usual, turbulent flow exists in the exhaust duct, there will be considerable heat transfer through the relatively thin walls of the pipe. This heat will likewise be picked up by the inflowing air, the pick-up being accelerated if the duct be fitted with longitudinal fins or vanes which would greatly increase the heat transfer area.

This warmed air duct need not enter the room at or near the intake end of the exhaust duct—in fact it should not, if looping of the air flow is to be avoided—but it may be piped through the regular hot-air heating pipes to suitable points in the room. When the spray room is closed off from the remainder of the plant, the exhaust fan itself will provide the circulation through the heat transfer duct, although a slight pressure may be built up therein to speed air flow by installing a blower or fan at the outside end of the unit.

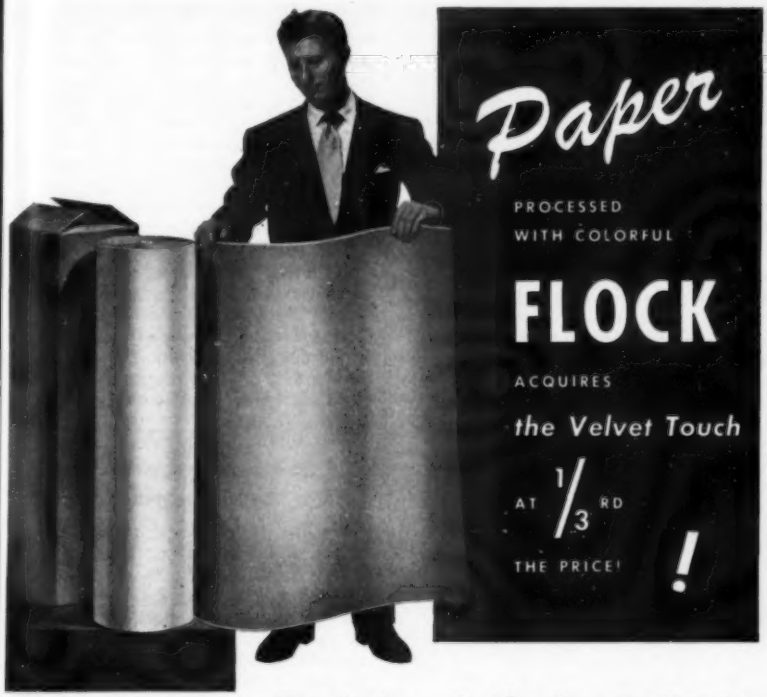
Under favorable conditions of air circulation, it should be possible to maintain a 10° temperature differential between air in the exhaust line and that returned in the flow through the intake system. This figure will, of course, vary with weather conditions, and with the efficiency of the insulation applied around the outer duct. But any engineer specializing in heating and ventilating can furnish data which will allow this factor to be checked closely, and the length of heat transfer unit can be proportioned so as to derive maximum benefit.

Where steam or hot water radiators are used to heat the spray room, installation of a heat-transfer pipe surrounding the exhaust system will show marked savings in heat units required to maintain desired warmth for best working conditions.—ELTON STERRETT.

What are Emulsions?

We are now interested in learning something about emulsions, such as water and oil or water and wax. What makes them possible?

It is common knowledge that oil, wax, or grease will not actually dissolve in water. However, it is possible to prepare stable mixtures of such materials in water by the use of a surface active agent called an "emulsifier," which keeps one liquid more



Above illustrates individually cartoned roll of "Rayon Velour Paper" as manufactured and processed by Flock Embossing Corp., 598 B'way, New York City.

•

Available in 25 spectacular colors

•

Rolls are 40" wide Lengths approx. 67 yds.

—Here Again . . . Another Use-wise Function of CLAREMONT FLOCK!

New Applications are Popping Fast

A *little* flock—a *little* paper—a *lot* of rich appeal! Paper processors are capitalizing on flock's quality to simulate rich fabrics at fractional cost. Unexcelled for display draping, gift packaging, jewelry and candy boxes, etc. Check this exciting new medium with your box maker, paper merchant or flock processor. For complete details concerning flock and its uses, write us direct—today!

CLAREMONT WASTE MFG. CO.
CLAREMONT, NEW HAMPSHIRE

or less permanently dispersed in the other.

Two liquids which under normal conditions, are insoluble in each other can be dispersed into an intimate mixture called an "emulsion" by the action of an emulsifying agent. Milk is an example of an emulsion in which the emulsifying agent is present naturally; in most industrial emulsions the emulsifying agent is present na-

When you examine an emulsion under a microscope, you see that it consists of a liquid medium in which are suspended minute droplets of a second liquid. When the medium is water and the droplets are oil, the emulsion is called the "oil-in-water" type and is readily diluted with more water. If the reverse is true—that is, if the water is dispersed or suspended in oil—it is of the "water-in-oil" type and can be further diluted only with oil.

Three essential ingredients are used to make an emulsion: 1) the insoluble material to be emulsified; 2) the water; 3) the emulsifying agent, such as an amine soap or similar colloid, which allows the emulsion to be made, and which confers stability.

To obtain such a fine division of the dispersed liquid, agitation is required during preparation of the emulsion. The emulsifying agent is necessary to lower the interfacial tension, so that extremely fine drops can be easily formed and so that they have restricted tendency to recombine.

The emulsifying agent provides a film surrounding each particle which actually prevents it from coalescing with other particles. The uniformity and stability of an emulsion, therefore, depend largely upon the effectiveness of the emulsifying agent. In general, any product or mixture of products that is water insoluble and can also be liquefied below the boiling point of water may be put into emulsion form.

The usual materials that are so dispersed include aromatic hydrocarbons and chlorinated solvents, hydrocarbon oils and waxes; animal and vegetable oils, waxes, and fats; and greases and asphalts. Many mixtures of these may be used; and furthermore certain solids, such as fine powders and abrasives, are often added. As a rule, the less highly refined the oil or the greater the impurity content, the more readily it is emulsified.

The purity of the water used has an effect upon emulsion stability; any soluble electrolytes present will adversely affect the product. For a short time after being made ordinary tap water may be used but for emulsions that must be permanent the use of distilled water is necessary.—C. C.

Lacquer to be Put on Wet Aluminum

We are interested in a lacquer that can be applied on a partially wet aluminum surface. The moisture on the surface will be from a rinse bath with danger of trapped pockets of water on the product. If you know of any manufacturers of a product which may fill our needs, their names and product will be appreciated.—M. Mfg. Co.

We do not know of any such lacquer. Can some reader help us?

Rather than try to find such an impossible material, we suggest you direct your efforts toward getting the surfaces of your products completely dry before the application of any paint or lacquer. This is Rule No. 1 in any kind of painting or finishing operation. It might be necessary to slightly invert or slowly rotate each product (or a group of products) to drain off any entrapped water; then the products could be arranged to pass through a dry-off oven.

If the entrapped moisture happened to be quite small, the dry-off oven

EXTRAS . . .
AT NO EXTRA COST

● Perfection Synthetic Flat Finishes are made by a new and different flattening process where flattening is accomplished by chemistry rather than foreign flattening agents. These are the EXTRAS in Perfection.

- A Beautiful Rubbed Effect Appearance
- Water-proof and Liquor-proof
- Free From Orange Peel
- [illegible] Upon Standing
- A Perfectly Clear Finish to Bring Out the Utmost Beauty of Wood and Stain
- Will Dull Rub or Take a Mirror Polish
- Will Not Haze or Sweat Back

Perfection costs no more even with all these extras. To judge for yourself write for free samples. There is a full range of sheens.

PERFECTION PAINT & COLOR COMPANY
715 E. Maryland St., Indianapolis 2, Indiana

Perfection SYNTHETIC FLAT FINISHES
WATER-PROOF LIQUOR-PROOF

alone would quickly evaporate it as well as evaporating all of the surface moisture or dampness on the products. Passage of parts through a dry-off oven before painting is common practice in many factories.

After the clean surfaces have become perfectly dry it is then safe to apply paint, varnish or lacquer, with reasonable assurance that the coating will adhere firmly and permanently to the metal surface.—ED.

To Fill Hairline Cracks

In the "Letters from Readers" section of August 1948 issue of INDUSTRIAL FINISHING, page 90, we notice an item in which we are vitally interested. It reads as follows:

"Will you please give us any information you can about a material that will work like a wax that can be used to fill in hairline cracks on top of a varnished dresser top? We find that we cannot burn in over varnish because the varnish scrapes off when cleaning up the burn-in job?"—N. C. Co.

Your published reply states that, "We are referring you to possible sources of information on this subject.—Ed."

Won't you please refer us to the proper source that can give us this information, as it will be very helpful to us?—M.F.M. (Furniture Mfg.).

Products made especially for repairing old checked and cracked varnish finishes are on the market. In a separate letter I am sending you the names of two products of this type, and the firms that make them. One of the manufacturers, by the way, advertises in this magazine.

The cracked varnish is flowed together by the solvent action of the crack eradicator. The eradicator is a thin liquid. It is flowed over the cracked varnish with a full brush. Go over the surface only once, and do not put any pressure on the brush. Above all things, do not brush out while wet. Allow the treated surface to stand about one hour; then inspect the surface. If the open cracks remain, apply a second coat in the same manner. One or two applications should do the job. The idea is to wet the surface well, but do not brush out the material or attempt to work it into the cracks.

To do the job properly, the surface being repaired should be perfectly flat and level, because the eradicator is thin and will quickly run off a vertical surface.

Let the treated surface dry at least 24 hours or more. Rub down with wet-or-dry sandpaper, about No. 360 grade, using water as the lubricant. Then apply one or two coats of fresh varnish and when dry rub the surface. The repaired surface should show no evidence of cracking or checking if the job is done right.

This method of repairing cracked varnish is much easier than cleaning off all of the old finish and refinishing the entire surface. The repair is reasonably permanent, although probably not quite as good as a complete refinishing job.—R. H. WAMPLER.

Chemco Products Moves

Chemco Products Co., Inc., manufacturer of chemicals for stripping off paint coatings, formerly located at 1059 E. 76th St., Chicago, Ill., has moved to 7740 W. 47th St., Lyons, Ill.

Materials Handling Show in Philadelphia Jan. 10-14

The third national Materials Handling Show will be held at Convention Hall, Philadelphia, Jan. 10 to 14. The exposition is devoted to various systems of handling materials in production and shipment.

The show will be one of the five largest annual industrial expositions to be held in this country. One hundred and ninety-two companies have leased 96,725-sq. ft. of net exhibit space at this time.

Kirco Wrinkle Distinctive - Uniform - Dependable

KIRCO

KIRCO WRINKLE

Available in fine, medium, and coarse texture and in a wide variety of colors and shades. Bakes fast to a hard, durable finish with unusual adhesion. Sample panels to meet your specifications sent on request.

All Exterior and Interior Surfaces of the Freedom Train are finished with KIRCO Lacquers, Synthetics and Adhesives.

KIRCO MODERN COATINGS

Kirker CHEMICAL COMPANY

ONE EAST ELEVENTH STREET • PATERSON 4, NEW JERSEY

Materials Supplies Equipment

Bonding Film for Metal

An unsupported film of pure adhesive that provides a metal-to-metal bond resistant to shear tests up to 3,500-lbs. per square inch was announced in July.

Called "Scotch-Weld" Bonding Film, it is transparent, roughly resembles cellophane in appearance, is provided in rolls like tape, and is not tacky to the touch. It is 100% adhesive, with no supporting material in the film.

The film is placed between units to be bonded and is curved by simultaneous application of heat and pressure—a heat of 300° to 500° F. for 5 to 60 minutes, and a pressure of 25 to 100-lbs. per square inch, both varying with the type of bond desired.

Preparation of surfaces requires only conventional cleaning. "Scotch-Weld" is a product of Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn., producer of over 1000 "3M" adhesives, coatings and sealers.

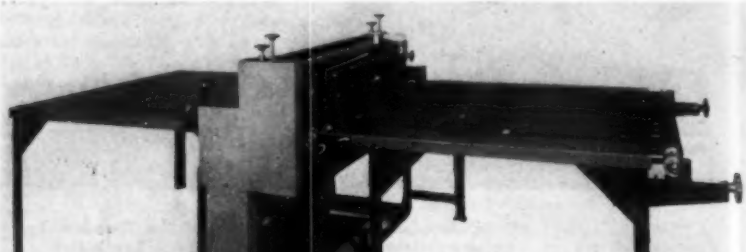
Roller-Coating Machine for Flat Sheets

A new variable-speed roller coater, 49-in. wide, with feed table and "take-off" conveyor, has recently been developed by the Gasway Corp., 6463 N. Ravenswood Ave., Chicago 26, Ill.

The machine is of multiple-roll construction, using two composition rollers and one steel intermediate roll. Rubber coating rolls can be supplied in place of composition rolls for certain types of work.

With the use of special rolls, an uncoated margin of predetermined width can be left on one or both edges of the sheet being coated. All rolls are adjustable, making it possible to accurately control the film thickness of the coating material.

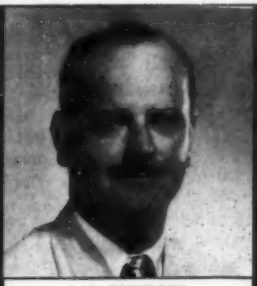
The lower drive roll is kept clean with a hardened and ground self



This new roller coater takes work as wide as 48-in. Its rate of feed is adjustable.

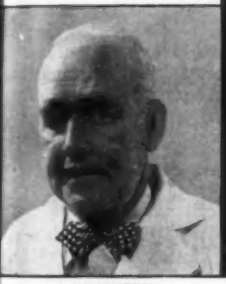
These 6 FULLER TECHNICIANS

L. C. BARNETT



L. R. BELTRAMI

A. W. BLOOMQUIST



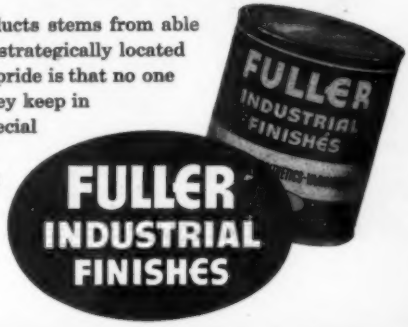
A. J. CRICHTON

G. P. HEISKANEN

S. W. HEGGEN

SPECIALIZE IN *WOOD FINISHING*

Fuller's leadership in wood finishing products stems from able technicians in well equipped laboratories strategically located to give prompt West-wide service. Their pride is that no one shall get ahead of Fuller! Not only do they keep in touch with every development in their special field, but they constantly originate new wood finishing procedures. Ample reason why most Western wood finishers use Fuller products! W. P. Fuller & Co. Industrial Finishes Division San Francisco.



adjusting scraper blade. The surface of the roll is hard chrome plated and ground.

A pair of driven rolls feed the work into the coating rollers and the belt type conveyor carries the work away, for ease of loading it into drying racks.

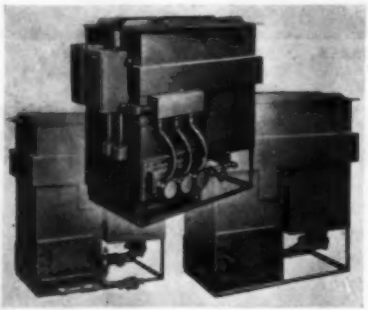
The coating material is pumped from the lower supply tank up to the upper supply pan and returns to the tank by gravity.

The variable speed drive permits coating speeds from 30 to 90-ft. per minute.

Some of the uses of the machine include the application of air-drying and baking enamels, as well as the application of protective coatings on ground and polished surfaces of sheet steel to prevent scratching during the fabrication operations.

Hand-Operated Degreaser with Quick Heating

Announcement of the new "625" Degreaser—2-dip hand-operated unit designed for rapid, safe and thorough cleaning of medium-size metal parts of all kinds—has just been made by Detrex Corporation, Box 501, Detroit 32, Mich.



This hand-operated degreaser will immersion-clean metal parts that can be put in and removed from a space 18x21-in. by 12-in. deep. It weighs about 500 lbs. Can be heated by electricity, steam or gas.

This unit can be heated by steam, gas or electricity, whichever is most practical at the particular time and location. It can also be furnished for combined gas-and-steam or gas-and-electric heating. It can be quickly converted from one type of heating to another, where seasonal changes in heating method give added economy or convenience.

The Detrex "625" Degreaser employs the immersion-solvent-vapor degreasing process originated by Detrex some years ago. It removes grease, oil and similar materials quickly and leaves all surfaces thoroughly clean and dry. To operate, the parts are simply lowered into boiling solvent, transferred within the machine to a cool solvent rinse compartment, and after a few seconds, they are removed through the solvent vapor zone. The Prem-A-Clor solvent used is nonflammable; it cannot burn or explode.

Porcelainite Bake Finish

John A. Peterson, Chief Technical Advisor of the United Lacquer Mfg. Corp., Linden, N. J., announces the company's new protective coating, "Porcelainite" which is an entirely new type of finish on the market—an enamel that can be compared favorably with porcelain.

In several respects, "Porcelainite" is superior to porcelain and has an extremely wide use on such items as ceramics, glass, and metal. It is applicable in any of the usual means such as spraying, dipping, or roller-coating.

"Porcelainite" will provide an excellent one-coat finish, and may be baked at 420° F. for 20 minutes. This comparatively low temperature is especially important where porcelain-

★ ★ ★ ★ 1875 - 1948 —— 1924 - 1948 ★ ★ ★ ★

Congratulations to

INDUSTRIAL FINISHING

On its 25th Anniversary

Added years give substance to a business which only time alone can enhance, just as Our 73 years of experience and progressive development have made MAC'S FASHION FINISHES the "Standard of Quality and Performance" throughout the U. S. A. A brief description of our line follows:

LACQUERS — Available in clear and opaque, for application to surfaces of all kinds. Spread easily and give good coverage. Any sheen desirable. Attractive, outstanding finishes.

SEALERS — Ideally suited as first coat materials under clear gloss or flat lacquers. Give good body and sand easily. Also, work well under varnish and enamel! Try them!

VARNISHES — None better! Whether for dull, satin or gloss effects, Mac's varnishes will be found most economical and appropriate as finishing coats on low, medium and high priced goods.

STAINS — These are stains of distinction, with an established reputation for the highest quality. We've been making them since 1875. Mac's stains can be supplied for every need.

FILLERS — The Mac's Fashion line includes the more commonly used oil paste fillers as well as the quicker drying materials of recent development. Keep abreast of the times with Mac's fillers.

PRIMERS — Mac's Fashion primers insure full coverage and absolute protection as first coaters on metal, forming firm and lasting foundations on products subject to severe treatment and abuse.

ENAMELS — For wood, metal and other surfaces, air dry or bake. Mac's Fashion enamels, properly applied, stand up under all conditions to which painted articles are subjected.

WOOD BLEACH — Mac's Fashion bleach will bleach all kinds of wood including mahogany. Dries overnight to a definite bleached effect ready to sand, and ready for the regular finishing schedule. Samples on request.

THE LAWRENCE-McFADDEN CO.

Write for Production Test Samples

7430 STATE ROAD PHILADELPHIA 36, PA.

Headquarters for Fine Finishes Since 1875

like finishes are desired for certain alloys which cannot be baked at high temperatures. The finish has shown no sign of failure when tested for 500 hours in a 20% salt solution at 95° F. When tested for ultra vinylite resistance, 300 hours in a Fadeometer, a small imperceptable discoloration and no loss in gloss resulted. Aluminum and steel panels applied with one coat of "Porcelainite" have been tested after emersion in water at 110° F. for over 50 hours, with no loss in adhesion.

Adhesive to Hold "Snow" on Christmas Trees

Many novel and beautiful effects can be obtained by the use of a new liquid plastic resin adhesive designed

The coating of plastic adhesive followed by flock produces a "snow" covered tree.

to adhere white or colored cotton, rayon or wool flock to irregular surfaces, such as Christmas trees and branches of natural or artificial foliage. It is applied by hand brushing, spraying or dipping.

The adhesive can be diluted with water, the amount of dilution depending on the coating method employed. A few seconds after application, it forms a tacky film on the branches, the flock is then dusted or blown on the coated areas and the excess is shaken off. When finally dry, the adhesive holds the flock with a flexible and non-crystallizing bond. The adhesive is available in white (natural), red, blue, green or special colors.

The producer and supplier is Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill., and 630 W. 51st St., New York 19, N. Y.

Sanding Wood Sealer

Allied Finishing Specialties Co., 2611 W. Grand Ave., Chicago 12, Ill., announces a wood finishing material identified as V-7032-L Sanding Wood Sealer. The material is light in color, medium in viscosty, non-settling, and has 25% solids. It produces an effective sealer coat that has excellent resistance to cold checking, and which is easy to sand quickly.

Non-Electrolytic Anodizing of Aluminum and Alloys

Air Force-Navy Aeronautical Specification No. AN-C-170, dated March 5th, 1948, covers the specification for *chemical* films for aluminum and aluminum alloys.

The specification is more specifically written for alloy No. AL-24 (AN-A-12), the copper containing aluminum alloy. Prior to this specification the specification appicable to this type of alloy was limited to anodizing under Specification No. AN-QQA-696a.

This alloy, and others of similar

Everything for the Finishing Room . . .

LACQUERS
SEALERS
STAINS
FILLERS
SYNTHETICS
PRIMERS
WOOD BLEACH
VARNISHES

The Gilbert Spruance Company
RICHMOND AND TIOGA STREETS
PHILADELPHIA 34, PENNA.

type, together with most of the common alloys of aluminum can now be treated by simple chemical immersion for a few minutes to conform to the above specification (AN-C-170). No electric current or equipment is used.

In view of this, much aluminum that was heretofore limited to anodizing can now be processed by simple immersion, using low cost equipment, in a period of a few minutes. Ordinary steel tanks are used. The treating solution is heated and maintained at about 200° F., and the entire operation is quite economical.

The cycle consists of cleaning and rinsing, followed by treating and rinsing and finally by sealing and rinsing.

Licenses to operate this process in your own plant are available. Also production facilities are available on a continuous production basis, in Philadelphia, Pa. In the meantime samples will be treated at no cost and no obligation to sender.

Chemoxiding ANC170 is a development of Technical Processes Division of the Colonial Alloys Co., Philadelphia 29, Pa.

New Automatic Parts Washer

A new safe, and unique principle of mechanical parts washing has been introduced by The Protectoseal Co., 1920 S. Western Ave., Chicago 8, Ill. Known as the "Air-Matic", this automatic parts washer offers complete fire protection in the use of flammable cleansing solvents. It is compact and portable so it can be set up alongside production machines or be used in maintenance and repair shops.

Washing of parts is achieved by moving the perforated basket, with contents, up and down through solvent. The machine is engineered to produce least possible turbulence and therefore permit greatest flow of liquids over the parts. Parts move through the liquid; not with it. Tests have proved this lack of turbulence is also a safety factor in that fewer explosive vapors are created from the flammable solvent used.

A reciprocating air motor was chosen because it is economical and efficient. With an air motor there is no hazard of an electric spark igniting flammable vapors. In the event that the contents of the washer should for some reason become ignited, the cover is designed to automatically close and snuff out the fire. The "Air-Matric" will operate on any compressed air supply.

Uses flammable cleaning solvents safely.

SPECIALISTS
in fine
INDUSTRIAL
FINISHES

Manufacturing a
COMPLETE
Line of Industrial
and automotive finishes
for many of the
country's finest
firms.

Send us your most difficult problem. Our laboratory staff is second to none.

Strathmore Products, Inc.

1970 W. FAYETTE ST. SYRACUSE, N. Y.

Specialists in Fine Industrial Finishes

New Jersey Factory

Unifilm Paint Company

SOMERVILLE, N. J.

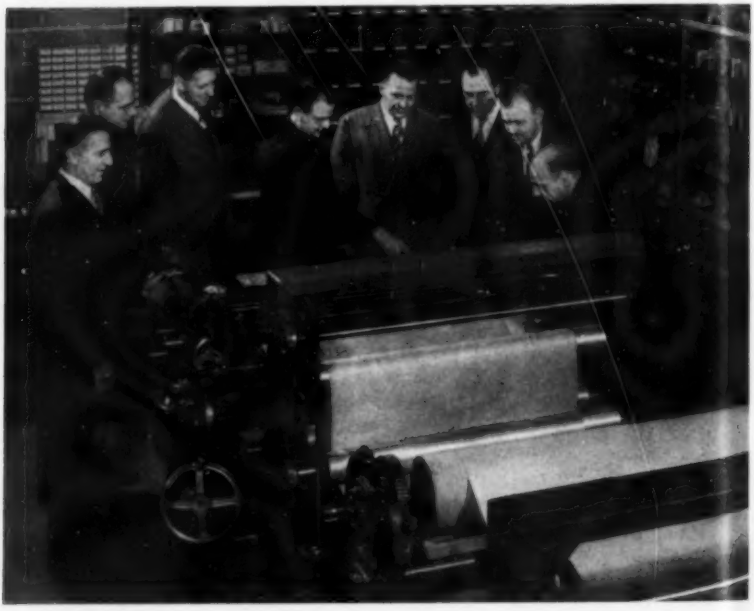
Fire Retardant Treatment

The fire retardant, "Flamort," is a product of the Flamort Chemical Co., 746 Natoma St., San Francisco 3, Calif. During the late war, the Navy employed Flamort to flameproof the wood framing, roof, trusses and windows in its West Coast hospitals. Since then, "Flamortizing", as the fire-resistant treatment is called, has been applied successfully in many commercial, agricultural and industrial fields, wherever wood needs protection against the hazards of fire.

The application of Flamort Fire Retardants on wood or wood products is simple and fast. The chemical can be either sprayed on with a pressure gun, or applied at the mill or yard by tank-dipping. Either method is effective for permanent fire protection. One application lasts indefinitely.

Flamort Fire Retardants are completely safe and do not in any way impair the strength of materials. Wood surfaces after treatment can be painted, stained or otherwise finished without harming appearance or durability .

Flamort Fire Retardants are also widely used to protect cloth, paper, canvas, rugs, upholstery and other



District Engineers attending a sales engineering conference of Industrial Ovens, Inc., at Cleveland, October 12 to 14, are shown inspecting one of the Company's newly designed machines for coating paper, textiles, film and foil. Pointing out some of the exclusive features of the new equipment is C. A. Litzler, President.

Introducing

- **HUDSON'S**
- **3-in-1**
- **LIQUID COMPOUND**

RUBS - POLISHES - WAXES
In One Operation . . . . .

No cleaners required after compounding.

No more messing with thick gummy compound.

Dark colors for mahogany.

Natural for Blonde, Toasted Mahogany, Maltes and Light Walnuts.

Leaves no light color in routes when it dries.

Polishes up to a beautiful sheen.

Does not settle.

Try five gallons at drum price.

HUDSON SUPPLY COMPANY

BOX 21, HUDSON, North Carolina

"soft" materials whose flammable characteristics are so often responsible for one swift spread of fire. Since materials are left colorless and odor-free after "Flamortizing", the process is widely used in theaters, hotels, schools, nightclubs and other institutions where fire is always a disaster-making possibility.

White Baking Enamel

Maas & Waldstein Co., manufacturer of industrial finishes, Newark 4, N. J., announces a new baking enamel recently developed for use on the reflector panels of light fixtures. This material, known as Codur Gloss White Baking Enamel 68080, has proved extremely satisfactory because of its unusual resistance to humidity and salt spray, and because of its high light reflectivity.

Codur Gloss White Baking Enamel 68080 exceeds the minimum reflectivity tests, as established by the Certified Lamp Manufacturers, in having 87% reflectivity. In addition, this material withstands 1000 hours humidity test and shows no breakdown when subjected to 500 hours of salt spray test.

Lighter But Stronger Fire Extinguishers

American-LaFrance-Foamite Corp. of Elmira, N. Y., offers a complete new line of 2½-gallon welded bronze fire extinguishers to replace riveted and copper fabricated units of the same capacity. They are soda-acid; foam; plain water; and anti-freeze water types.

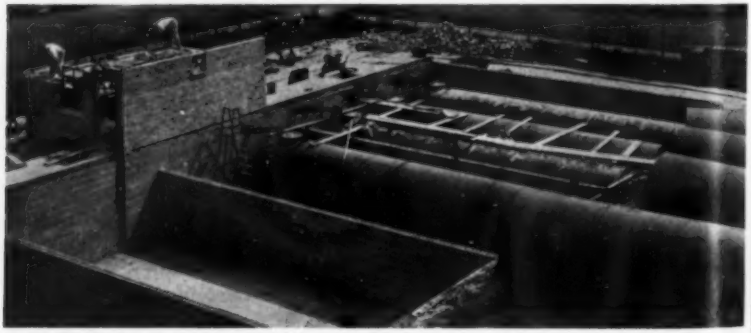
Each extinguisher is lighter in weight by 4½-lbs. They are much stronger because the materials used have higher tensile strength, are more smartly styled, and are enhanced in appearance by the golden-hued color of the highly polished silicon bronze.

Tousey Installs Ten New Underground Storage Tanks

The Tousey Varnish Co. has completed construction and placed in service ten 10,000-gal. underground storage tanks on its factory grounds at 520 W. 25th St., Chicago, Ill.

The new tanks, which double existing tank storage capacity, will be used primarily for the storage of raw materials. They are controlled by a pump house which feeds materials to six outlets throughout the Tousey plant.

The new storage capacity is part of a steady, long-range expansion program. Tousey has been manufacturing since 1885 and today supplies paint products to a large section of American industry.



Picture snapped while the work of placing and connecting underground tanks was going on.

SUPERIORITY UNIFORMITY
PYRO-CELLO-FILM
THE AMERICAN VARNISH COMPANY • CHICAGO 22, ILLINOIS
ESTABLISHED 1883

MADEWELL CHAIR COMPANY
SHEBOYGAN, WISCONSIN

MAKER OF FINE UPHOLSTERED CHAIRS, CHOOSES

PYRO-CELLO-FILM

because it gives such rich beauty and is so completely mar and scratch resistant.

You, too, will find PYRO-CELLO-FILM enhances the beauty of your wood products and increases your reputation for fine craftsmanship. PYRO-CELLO-FILM is not only highly heat and water resistant, but is so tough that alcohol and acids can do no damage. It is unharmed by saline solutions and impervious to fats and greases. Unqualified endorsement by leading manufacturers of wood products is evidence of the wonderful results you can get with PYRO-CELLO-FILM.

See It and You'll Believe It!

Send us one of your wood products. Without cost we will finish it with PYRO-CELLO-FILM. When you get it back, you'll see for yourself how completely PYRO-CELLO-FILM solves your finishing problems. Write for complete information today!

SUPERIORITY UNIFORMITY
AMERICAN

PYRO-CELLO FILM

is an exclusive development of The American Varnish Company.

Established 1883

AMERICAN VARNISH COMPANY

1126-1140 N. North Branch Street
Chicago 22, Illinois

Manufacturers of varnishes — paints — stains — lacquers — synthetic enamels—cello film—soldering flux and special coatings.

MANY of the men in industry who look over the reading pages of INDUSTRIAL FINISHING carefully every month have expressed admiration and some degree of curiosity at the timeliness, variety and the general all-round value of its editorial contents. The articles do have real substance. They are authoritative. Important and experienced men in the indutry read them and refer them to others.

More requests than we can fill come in for back copies (often several years back), tear sheets and reprints of articles published in current and past issues of the magazine. Some firms order thousands of reprints of articles published in current issues. Also, many inquiries come in for information about various technical problems, methods and processes; and for sources of supply for certain materials; equipment and supplies to be used in connection with finishing, product painting, metal cleaning and force drying.

Speaking with authority for the finishing industry

Editorial Plans Based on Reliable Information

Planning what to publish in each issue of INDUSTRIAL FINISHING is based on what men in the industry want and need now and in the future. The industries served include all users of product finishes (protective, decorative and identification coatings); and users of equipment for, 1) preparing surfaces to be coated; 2) all coating operations; and 3) for drying and polishing the coatings that have been applied.

How do we find out what is needed now and what will be needed in the future? By maintaining continuous close contact with leading concerns and key men in the industries served. This contact is partly personal and partly through a heavy volume of correspondence. When an individual or concern anywhere wants information about anything that relates to finishing, INDUSTRIAL FINISHING is almost sure to receive that inquiry, or a similar one, either directly or through someone else.

Keeping in close touch with what is going on and what is under way for the future enables us to plan wisely for INDUSTRIAL FINISHING'S readers. With this accurate knowledge of what is really wanted and needed, and what is timely now and in the future, the Editor prepares definite assignments which call for illustrated feature articles, medium length articles and short articles. Some of these assignments are accompanied by carefully prepared outlines that include lists of suggested points to be covered and illustrations to be obtained.

Who Writes the Articles

INDUSTRIAL FINISHING has a full-time Associate Editor who visits industrial concerns and gets what material he needs in the way of information and pictures (regardless of expense) to prepare illustrated feature articles which have been assigned to him.

Our Associate Editor is a progressive, experienced, well informed man especially qualified to handle tough and unusual assignments. He likes his work; takes a great deal of satisfaction in getting all of the intimate facts about the how, what, when and why of modern methods, processes, new production layouts, materials, equipment, supplies and accessories. He submits his completed article to a responsible exec-

utive in the firm for correction or okay and gets official approval before releasing it to be prepared for publication.

Supplementing the work of our Associate Editor, we have on call more than 100 men in various responsible positions in industry, to whom we can give special assignments in reference to technical problems and questions. Among these men are paint chemists, department supervisors, foremen, executives, practical finishers, product designers, industrial engineers, production men and a few special writers and photographers who have access to sources of information that interest us.

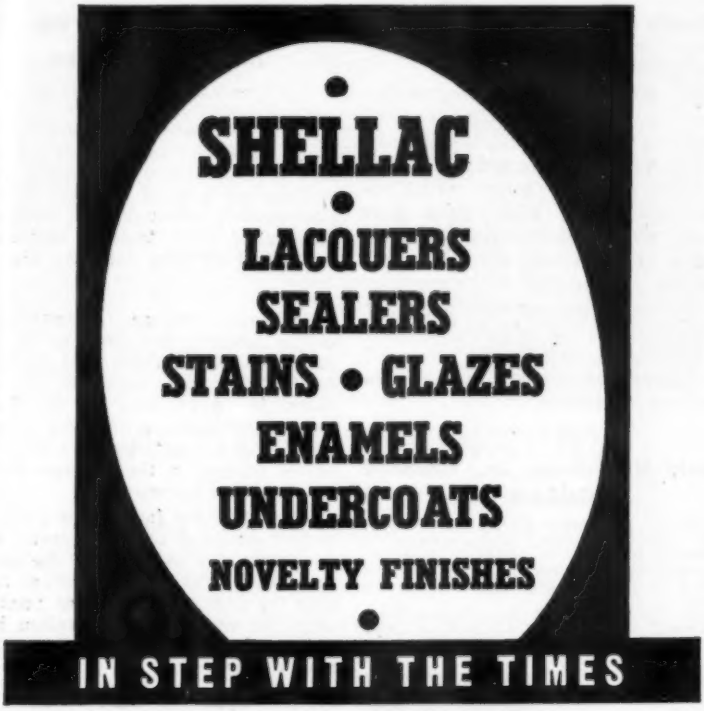
These men are specialists in their respective lines; are broad-minded, cooperative and dependable; enjoy doing an occasional bit of writing that deals with their own line of work. They welcome opportunities to exchange practical experience and ideas. They are not obliged to "write for money" but we pay them generously for what they do for us. What they write for INDUSTRIAL FINISHING is original, informative, authoritative and exclusive.

With this kind of an editorial setup, INDUSTRIAL FINISHING'S readers are assured of top quality material which deals with their own and closely related lines of work. They get not only valuable information but many stimulating ideas and interesting suggestions.

INDUSTRIAL FINISHING'S readers are protected from 1) boresome "desk articles" that are thrown together by hacks "writing for money at space rates"; 2) articles from incompetent and inaccurate sources; and 3) articles that are merely commercial plugs or "build-ups" for some product.

Preparing Editorial for Presentation

When manuscript and pictures come to the Editor, the material is carefully looked over. All manuscript is edited and often completely rewritten to make it clear and easy to understand in a single rapid reading. Titles, paragraph heads and captions for pictures are carefully prepared and placed. Illustrated feature articles that rate an especially attractive and striking presentation are handed over to our artist who prepares an editorial layout with art work suited to the



IN STEP WITH THE TIMES

Industrial Finishes

that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

subject. No expense is spared in presenting the article effectively and attractively.

So you see that progressive thinking, plus money, time, experience and intelligent effort—all wisely balanced and directed—enter into the editorial setup which is responsible for what goes into INDUSTRIAL FINISHING'S reading pages. This is our way of maintaining and adding to INDUSTRIAL FINISHING'S splendid reputation for integrity and real editorial value—a reputation universally conceded by all of our readers, advertisers and acquaintances.

David N. Burruss, Jr., Honored by Glidden Co.

Officers and directors of the Glidden Co., Cleveland, Ohio, recently gave a luncheon in honor of David N. Burruss, Jr., director of engineering, who has completed 25 years of service with the company.

Mr. Burruss joined the Glidden Co.'s Chemical and Pigment Division in 1923. He served as manager of this division's Collinsville, Ill., plant and as vice president of a Glidden subsidiary—the Southern Pine Chemical Co. He was general manager of the company's Metals Refining Co. division, Hammond, Ind., prior to his appointment as director of engineering last November.

D. N. Burruss, Jr.
Director of
Engineering for
The Glidden Co.

At the luncheon, Dwight P. Joyce, Glidden president, presented Mr. Burruss with a gold watch in recognition of his service to the company.

Random Comment on the Industrial Scene

(Continued from page 9)

training follows with periodic evaluation of progress made. The end objective is to insure the smooth and undisturbed flow of business during emergencies, through an adequate number of well trained executives capable of stepping into any breach.

* * *

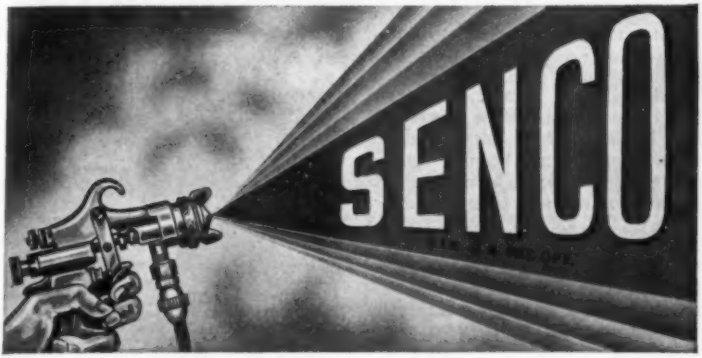
Packaging Change. Simplification is the present day keynote in the package trade. Video and popular demand for more legibility are responsible. Advertising by television has emphasized the need for prominent, easy-to-read trade marks or names printed on the package where the customer can see it.

Heretofore the face of the package carried most of the eye-appeal, but due to the size and shape of the package, the retailer stacked them so that only the edge where the fine print is could be seen. Standardization has reduced the number of packages. This makes sense.

Perhaps it would be a good idea, for manufacturers to view their products, regardless of what they are, through television in the retail store, or in actual use either in the home or in industry. Might get some good ideas for improvement. The camera's eye sees more than the human eye.

* * *

Scarce Metals. Along with world wide unrest comes the probability that producers and importers of copper, lead, zinc, cadmium and bismuth will shortly enter into an agreement on a set-aside policy of these metals for the Government's stockpile. These metals are not plentiful now, and while the voluntary set-aside program is most commendable as well as



LACQUER THINNERS
OF
OUTSTANDING QUALITY

Custom-made to exact specifications for your particular requirements under our strict laboratory control.

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Submit your thinner or solvents problems to us . . . for prompt and accurate advice. No obligation whatever is involved.

IN THE PORT OF PHILADELPHIA

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desirable, industrially speaking, we will have to again look to substitutes. Incidentally scrap iron is very scarce now without any set-aside program.

* * *

Alkali-Resistant Finish. A synthethic enamel has been developed which, it is said, is impervious to alkalies. Tests have been made by applying this material to an alodized aluminum surface and then baked for 30 minutes at 425° F. White coatings did not discolor. Test panels were dipped into a hot caustic solution which attacked the bare aluminum but had no damaging effect on the coated surface.

* * *

Phosphorescent Pigments. There seems to be a trend toward the use of these paints in the silk screen industry. Use is quite diversified, ranging from religious emblems and advertising pieces that glow in the dark, to pictures of flowers and people. Those who design display advertising are quick to take advantage of the latest developments in the finishing industry.

Hilo Appoints Sales Representatives

The Hilo Varnish Corp., Brooklyn, N.Y., announces a number of appointments.

Harry Fels has been appointed Technical Engineer in the Philadelphia District, to present Hilo industrial finishes to manufacturers. He was formerly with a finish manufacturer in Detroit, Mich.

Philip Landau has been made Technical Engineer in Northern New Jersey, with similar duties. Mr. Landau has been in the Hilo Research & Service Laboratory for three years.

Both men named above will assist Mr. William Gloeckner who has long represented Hilo in these territories.

James Taylor has been assigned to the Western Massachusetts and Eastern New York territory for Trade Sales. Mr. Taylor was formerly with another nationally known paint concern.

John Schuster who has been with Hilo for some time, takes over the Northern New Jersey District for the Trade Sales Department.

E. H. Fay, Jr., General Manager of Robertson Company

The Robertson Co., Inc., wood and metal coating manufacturers in Louisville, Ky., announces the appointment of Mr. E. H. Fay, Jr., as General Manager.

E. H. Fay, Jr., is made General Manager of Robertson Co., Louisville, Ky.

Upon graduation from Colgate University in 1937, Mr. Fay joined the staff of a varnish company in Pennsylvania, and in recent years was with them in the capacity of Vice President and General Manager.

Hogstrom Becomes Supt. of Stille-Young Plant

Stille-Young Corporation, manufacturer of finishing materials, Chicago, Ill., announces that Mr. Edwin Hogstrom, who joined the firm earlier this year, has been made general superintendent of the plant and head of both production and service.

Edwin Hogstrom is now general superintendent of the Stille-Young plant in Chicago.

Mr. Hogstrom is well known in the industry as a supervisor of finishes and producer of many special finishes; and as a technical advisor to the furniture manufacturing industry and related industries. He has had extensive practical experience in many kinds of finishing operations, and has written several articles and serviced many inquiries for INDUSTRIAL FINISHING Magazine.

You can produce on any material the following surface finishes:

FELT - SUEDE LEATHER - MOHAIR VELOUR - VELVET - CARPET

FUNCTIONAL USES

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Watch Those Silicones!

IT WILL BEHOOVE all industrial finishers to keep a weather-eye on developments in the silicone industry. This means more than routine testing of silicone products as they become commercially available. Every finishing engineer should keep abreast of the research work being conducted, and should study the results for possible application to his own problems. Such vigilance may result in some very profitable information.

The silicones are here to stay, and from all indications are going to revamp a good many industrial finishing processes. The number of silicones possible to produce is limited only by the number of ways in which silicon, oxygen, hydrogen and carbon can be combined. So far, uses for the silicones have multiplied as rapidly as their number. Some of these uses are almost startling in their implication.

The commercial baking industry, for instance, has discovered that one silicone product, sprayed on baking tins, eliminates the necessity of using greased tins and is good for some 200 bakings before the coating must be renewed. The bread does not stick to the tins, nor is it harmed by the presence of the coating.

Despite color range restrictions caused by the necessity of using mineral pigments only, the silicones have already proved their value for use on products which must operate throughout a wide temperature range. Ovens, refrigerators, ranges, radiators, exhaust stacks, etc., come under this category. In one controlled test, a gasoline engine muffler operating outdoors at 500° F. had to be repainted each month with an aluminum pigment. A subsequently applied silicone coating is still in perfect condition after a year.

Electric motor insulation made of Fiberglass or mica bonded with a silicone promises to reduce by one-half the size of motors due to better heat-resisting properties. In one test, a motor was operated for 3000 hours at plus 550° F. before insulation failure. Conventional insulation and varnish, operating under the same conditions, failed in a few hours. In another motor, the aluminum rotor actually froze in its bearings and became so hot that it melted. The silicone-bonded insulation material was unharmed.

Current high prices of the silicones, averaging something like $7.00 a pound, restricts their use to where performance is more important than price. But greater production facilities, streamlined production processes, and increased demand will, like in the plastics industry, bring these prices down. Huge corporations are gambling on the future of the silicones. Dow Corning Corporation has a new $3,000,000 plant at Midland, Mich., which will be used for silicone production, and General Electric has just completed another at Waterford, New York.—GILBERT C. CLOSE.

Atlas Industrial Finishes Promotes Three Executives

The Atlas Powder Co.'s Industrial Finishes Department has made the following promotions at the Stamford Conn. branch.

Donald A. Metz has been appointed General Manager; W. G. Sheane, Sales Manager; and John E. Forster, Plant Manager. These promotions apply only to the Stamford branch.

Mr. Metz, until his recent promotion, was Assistant General Sales Manager at Stamford; he is a graduate of Sheffield Scientific School, Yale University. During the war he was in the Army, being discharged a Lt. Colonel, and was in charge of organizing and operating the Paint & Chemical Laboratory at Holabird Depot, Baltimore, Md.; later he performed the same duties at Aberdeen Proving Grounds. As Chief of the Laboratory, he directed research and development on the first lusterless finishes used by the Army on automotive and ordnance equipment.

(Continued on page 157)

Mr. Sheane, formerly a member of the Atlas Technical Staff, Stamford, Conn., is a holder of two degrees in chemical engineering; he is perhaps best known in the finishing industry as a former Editor of a N. Y. finishing magazine. Besides being a graduate of Rennsselaer Polytechnic Institute and Carnegie Institute of Technology, he is an active member of the American Institute of Engineers, American Chemical Society and American Electroplaters Society.

W. G. Sheane, now Sales Manager at the Stamford, Conn. Branch of Atlas Powder Company's Ind. Finishes Dept.

Mr. Forster, prior to being named to his new position, was Supervisor of the Plant Service Group at the Stamford branch. During the war he was a captain in the Air Corps doing corrosion control work; he is a graduate of Yale University, an active member of the N.Y. Paint & Varnish Club, and belongs to the Alpha Chi Sigma fraternity.

Basic Flameproof Patents Now Available to Industry

The use of antimony oxide and chlorinated paraffin or chlorinated carriers, a well known combination used extensively during the war, is now available for general industrial use.

These basic patents are the property of Wm. E. Hooper & Sons Co. and, by arrangements recently completed, are available for sub-licensing to the paint industry by the Watson-Standard Co., Pittsburgh, Pa.

This announcement comes at a time when the interest in fire protection is great and a proven method is advantageous. The unusual feature is that antimony oxide and chlorinated paraffin are particularly necessary in effecting flame retardation in low pigment volume ratio paints. Interior and exterior paints, as well as industrial finishes of various types, are available and adaptable to this treatment.

Inquiries in regard to the sub-licensing arrangement should be addressed to Mr E. H. Kipp, 1415 Park Bldg., Pittsburgh 22, Pa., or to the Watson-Standard Co., P. O. Box 1825, Pittsburgh 30, Pa.

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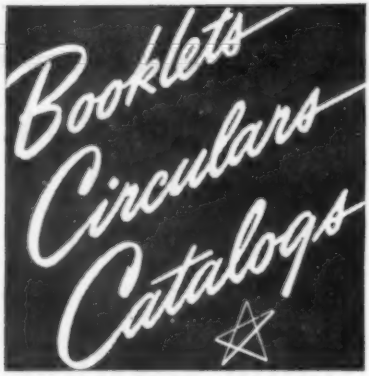

Scientific Instruments

A 16-page illustrated booklet which reveals information of interest to finishers is offered free by Eberbach & Son Co., Ann Arbor, Mich.

Ebonol Coloring & Blackening Processes for Metals

An 8-page illustrated booklet describes various Ebonol products for chemically treating the surfaces of bright clean metals to give them a permanent black finish or to prepare them for subsequent color coatings of enamel. For a free copy of this new booklet write Enthone, Inc., 442 Elm St., New Haven, Conn.

Paint Agitators or Stirrers

A new illustrated folder describes and illustrates different types of hand-crank stirrers or agitators for stirring up the contents of 55-gallon and smaller steel drums. Diagrams show how the vertical sweep of the improved agitator produces a complete stirring-up of all the contents of a drum. For a free copy of this interesting and informative folder, write Farrington Pickwick Co., 112 E. 19th St., New York 3, N. Y.

Two Quizzes on Management Skill

The American Management Association has published two quizzes by which supervisors, foremen and higher executives can test their knowledge of management principles.

"What's Your Management I.Q.?" is designed to enable executives, supervisors, and foremen to appraise their knowledge of managerial principles and their ability to train and lead workers.

With "Self-Analysis Quiz for Supervisors and Executives," a much longer test, higher-level supervisors, executives and those who aspire to such positions can score themselves on knowledge of executive work.

Copies of these tests are available for distribution to supervisors, executives and students at cost in quantity lots from the Association headquarters at 330 W. 42nd St., New York 18. N. Y.

Black Finishes for Metals

A new loose leaf book published by The Mitchell-Bradford Chemical Co., 2446 Main St., Stratford P. O., Bridgeport, Conn., reveals instructions for using the company's "Black-Magic" products to produce by chemical action, a black finish on the surfaces of various metals—for example, steel, iron, zinc, cadmium, copper and brass. Wax-base and oil dip finishes, the Silco glass-base baked finish, and metal cleaners are also described.

Preventing Corrosion Revealed in New Free Booklet

The Tar Products Division of Koppers Co., Inc., Pittsburgh 19, Pa., has issued a new 12-page folder which gives expert direction on the application of cold-applied protective coatings, especially designed to prevent corrosion and deterioration.

The informative material describes protective coatings, as well as giving general information on surface preparation, coating thickness, and methods of application. The various types of protective coatings made by Koppers for cold application are described in detail, together with information on coverage, primers needed if any, drying time, thinners that can be used, and temperature limits.

Free Booklet Tells About Lacquer Sanding Sealers

The results of an extensive investigation of lacquer sanding sealers, with particular reference to ease of sanding and cold-check properties, are now available in the form of a new technical booklet published by Hercules Powder Co., Wilmington, Dela.

Illustrated in the book are the type of effects on sanding and cold-check properties which the formulator can anticipate in his formulation and testing work.

Data are presented to illustrate the in-

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fluence of specific resins; the influence of the viscosity of the nitrocellulose; the effect of a film-former other than nitrocellulose; the effect of mixed film-former; the effect of varying the amount of zinc stearate.

The research which developed the data for this book was carried on at Hercules' Experiment Station and was devoted chiefly to study of the sealer film alone, rather than to considering it in conjunction with a complete finishing system.

Complete Finishing Setups With Centri-Merge Spray Booths

An attractive 12-page booklet, 8½x11-in., printed in three colors, illustrates features and installation views of Schmeig Centri-Merge spray booths in connection with complete production finish systems which include metal cleaning, rustproofing, painting and baking the paint coatings. For a free copy of Catalog 480 write Schmeig Industries, Inc., 312 Piquette Ave., Detroit 2, Mich.

Catalog of Finishers' Supplies

The Star Chemical Co., Inc., 4500 Cermak Rd., Chicago 23, Ill., has brought out a new 32-page catalog bound in blue and white covers, which describes and illustrates a complete line of supplies and small equipment for finishers, repair finishers and refinishers.

Contents of the catalog include stains, lacquers, enamels, varnishes, bleaching materials, fillers, repair putty, cement, stick shellac and stick lacquer, cleaners, removers, polishers, tack rags, brushes, sandpaper, steelwool, burn-in knives, knife heaters, repair kits, etc.

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"O. A. Both Corp., Boston, Mass., happens to be the first concern advertising Puritan Silver Paste in this magazine. Our first customers through INDUSTRIAL FINISHING are still with us on this, as well as our gold bronze, as they have found nothing better on the market.

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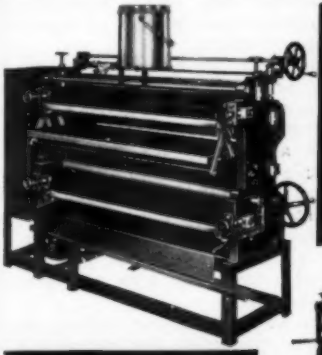

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Industrial FINISHING Editorial

Progress of Finishing During 25 Years

Finishing as an industry has undergone many changes in the past 25 years. All of the changes have increased the effectiveness as well as the efficiency in the application of protective and decorative coatings.

These changes may be divided into three classifications—methods, materials and equipment. Basic methods of finishing have changed little, but new materials and modern equipment have produced better and faster methods.

Manufacturers have become surface conscious; that is, more and more *attention is being given to surface preparation before painting.* The conveyorized machine for cleaning and rustproofing metal products has been developed in the past 25 years.

Great strides have been made in the development of new and better finishing materials. In the past 2½ decades alkyd and urea resins have come into being; also, the melamines used for hardening the alkyds. All types of synthetic enamels fall within that period. Before 1924 there were no wrinkle enamels, no hammered or 2-tone finishes; and lacquer was in its infancy.

The discovery and development of plastics has furnished the industry with convenient peel-off coatings for dry spray booths, protective envelopes for all-weather storage of products, and marine paints. Last but by no means least is the addition of chlorinated rubber to enamels to speed up drying and to give excellent resistance to corrosion.

Keeping pace with finishing materials, equipment for finishing has definitely contributed its share of progress. Since the first issue of this magazine appeared, conveyors have come into extensive use in connection with finishing both wood and metal products. Along with conveyors—and made more practical by them—are infra-red ovens for extremely fast baking of organic coatings on metal products. Refinements have been made in humidified ovens for force drying coatings of lacquer and enamel on wood articles.

A review of improved equipment would not be complete without mention of the water-curtain spray booth and the recovery of sludge. Also, in connection with spray finishing, is the electrostatic method of applying organic coatings.

The use of air filters and pressureized spray rooms as well as fully enclosed tunnels—also under pressure to protect wet coats between spray booth and bake oven—are products of this last quarter century. Improved dip tanks with agitators and electrostatic detearing equipment for removing the final drop of material that clings to the lowest point of a dipped article, are also products of this period.

The idea of heating certain materials to thin them for spraying has resulted in the development and use of safe equipment for heating paints, varnishes, lacquers and synthetic enamels.

The past quarter century has been one of improvement in the art of production finishing. Space does not permit mention of all of the improve-

ments and refinements in methods, materials and equipment. One of the finest contributions finishers have made is their use of improved technique in all phases of finishing, based upon knowledge they have gained in various ways.

Careless Painting Changed by Light

★ I have come to believe in the psychology of light. We manufacture farm implements and road machinery. As paint superintendent I am responsible for the proper coating of all service and repair parts, including individual pieces and assembled equipment. All work is spray painted along two overhead conveyor lines which are elevated in two spray booths to permit easy under-body spraying.

We are having entirely too many pieces of equipment returned by the inspectors for defective under-body coating. Spray operators would hit part of this surface too lightly; in some cases half of the underside would be properly coated while the other half was so skimpy that the raw metal would show through. I fussed and fumed and fought, but with no good results. We still had under-bodies to repaint.

Now just beyond the last spray booth, the overhead conveyor lines rise abruptly to carry the equipment into an elevated baking oven. At this point I had the electrician install two lamp sockets with reflectors pointed up toward the oven—one light under each conveyor line. Two 200-

★ *Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate thought on a live subject. The Editor welcomes guest editorials, paying for those published.*

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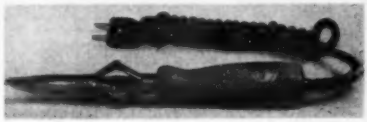

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watt lamps now flood-light the entire under side of all equipment going through; and one of the main cross aisles in the plant is adjacent to these flood lights, so that everyone who walks past may look up and see the results of under-body painting.

That move ended our paint rejects and under-body repainting—and that is the reason why I believe in the psychology of light.—P. S.

Container Labels; Keep Them Clean

★ Have you ever had an occasion to order a finishing material when your only source of information was the label on a sample can or a previous purchase? Have you ever found that label so obscured with run-down paint and drippings that it was difficult or impossible to decipher the necessary data?

There are two simple ways to avoid this annoyance. The easiest way is to instruct all employees who handle the material to use proper care in mixing or pouring. Spilled or run-down paint should be quickly wiped from the label or printing on the container. Really, all pouring should be done on the side away from the label. Some manufacturers put their labels on the side where the bail hinges, where there is less likelihood of it being smeared.

Of course, the best method is to keep a record of all materials used—whether production items or samples. It is a simple matter to transfer all vital information into a book as soon as the material is received. When it is used, a small aluminum color chip can be made. This can be fastened with masking tape adjacent to the data in the book.

As a further precaution against important labels becoming soiled or covered with paint, a piece of cello-

phane can be placed over the maker's description of the contents. The wrapper from a pack of cigarettes is ideal for this purpose. It can be held in place with masking tape around the edges.—GEORGE CONRAD.

Solvent Safety in Finishing Rooms

★ The importance of safety measures in industrial plants to prevent accidents and remove health hazards has long been recognized. In the finishing room there are some special hazards that should be guarded against; one is the danger from fumes, spray fog, and solvent vapors.

Solvents used in organic finishes do not constitute a health hazard unless the vapors reach a high concentration.

They may cause nausea, headaches and general discomfort. Solvent vapors exist wherever the finishes are being applied, or wherever coats of finishing material are drying. Adequate ventilation is necessary to keep solvent concentration down. At least two windows should be open (unless other means of ventilation are available) no matter how cold the weather.

Exhaust fans, especially near dipping tanks, are essential for removing the fumes. All spray fog should be entirely removed by the exhaust fans in spray booths. If it is not, investigate the condition and correct it. Sometimes not enough air is being moved through the booths. In some states the law requires a certain velocity of air movement through spray booths.

Another health hazard in the finish-department arises from the use of solvents to clean the hands. Solvents remove the natural protective oils from the skin, so that in cold weather cracks may form in the skin and open the way for infection. Certain preparations used on the hands to facili-

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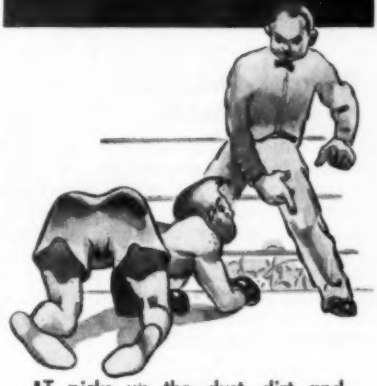

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tate cleaning off finishing materials are good, because then only soap and water are required for cleaning. It is good practice to keep some hand lotion available in wash rooms, so the workmen may use it and keep their hands free from chapping during cold weather.—ROLLIN H. WAMPLER.

Wonder Finishes Now Available

★ Industrial finishes in the past decade have progressed to the point where they are in a highly specialized and complex field. Paint chemists, assisted by the complete technical facilities of raw material suppliers, have converted complex synthetic resins, which had been practically laboratory curiosities, into practical and useful coating mediums.

Some of the spectacular types of coatings are: 1) those which deposit a rubber like film which resembles sponge rubber to such a degree that it is hard to tell the difference; 2) coatings for paper that simulate leather or oilcloth; 3) nonflammable coatings for cloth or wood; 4) luminescent coatings that glow in the dark; 5) wrinkle finishes of almost any desired pattern; 6) heat-resistant coatings which will withstand 500° F.; 7) roller-coating enamels for metals that withstand deep drawing operations, sterilization, and various chemicals, solvents and oils; 8) strippable coatings that protect metal parts in storage or transit, and which can be readily removed by peeling; 9) anti-sweat paints; 10) non-skid paints, and, 11) coatings resistant to the many acids, alkalis, solvents, oils and greases encountered in the industrial product field.

The development of these products has been made possible not only by the research and developments of the resin manufacturer but by collaborating associated fields. Solvent manufacturers were pressed into service to develop new solvents or blends of solvents to put the new resins into a liquid state so they could be properly applied. Pigment manufacturers worked to develop pigments of greater chemical resistance, higher heat resistance, and greater opacity. The

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drying oil industry has also made noteworthy contributions to faster curing and more resistant finishes.

Paint manufacturers, through their laboratories, have by extensive research utilized these new raw materials, developing new combinations and new manufacturing techniques so that the finished coatings could become a reality in the industrial finishing field.

The responsibility of the paint manufacturer does not end with the production of these coatings. Now, more than ever, technical sales service must be available to every industrial customer to teach him the characteristics and peculiarities of new paints, to help him develop the most ideal coating and baking facilities, and to see him through the inevitable production line troubles encountered.

Many paint manufacturers have instituted a program where their industrial salesmen spend periodic intervals in the laboratory, working with the chemists so that they have a better appreciation of the composition and characteristics of the coatings they are selling or trying to sell. This is a wise procedure. It will not only help their customers but will alleviate many problems that would otherwise have to be handled by the laboratory. —*Louis E. Martin, Chief Chemist, Plasteel Products Co.*

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Call in a Doctor of Finishing Regularly

★ We have all heard the exhortation that we should see our dentist at least twice a year. We are even told to see a physician at regular intervals to check up on the state of our health. I wonder how many finishing department heads think of calling in an expert on finishing materials periodically to check up on their finishing "headaches"? These "headaches" could be of various origins. They could result from—

1) Too many rejects.
2) Poor looks of finished product.
3) Too many operations.
4) Too high finishing costs.
5) Production "bottlenecks", etc.

The finishing materials expert has probably encountered problems like yours many times in his career. Very likely he will be able to make suggestions that will ease your mental burden and enable you to save your company some time and money.

Of course, it is apparent that some of these suggestions will involve such things as more modern spraying methods, ovens, etc., but in a surprisingly large number of cases, simple suggestions, based on years of experience, can introduce considerable improvement, cost-wise, quality-wise, and efficiency-wise, with little or no expenditure for materials and equipment.

Are you, perhaps, not using the most suitable type of fluid tip in your spray guns? Are you using a baking enamel that requires a long bake when a more modern finish, baking in only a few minutes would cut a production bottleneck? Are you using a 3-coat system where a 2-coat system, perhaps, would do? Is your finished product coming out dull and drab, whereas you would like to have a much more attractive finish for the competitive markets of tomorrow? Is your finish functional as well as decorative?

Most reputable companies that make finishing materials have large, experienced, well-trained staffs of technical personnel. Why not ask these "Finishing Doctors" to periodically study the state of your finishing department's health, and prescribe for you?—M. A. GLASER.

Customer Service Department Announced by Binks

J. F. Roche, President of Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., manufacturer of spray painting and water cooling equipment, announces the establishment of a Customer Service Department that goes far beyond the usual handling of customers' inquiries.

Because President Roche knows that the proper handling of inquiries is one of the best builders of good will, he has long required courteous and prompt attention to all inquiries. The new department extends this policy by centralizing all information and its dissemination, relieving other departments of details customarily handled by them.

The department has been established as an independent unit that is answerable to no other department. Another extraordinary feature is its location adjacent to the order and shipping departments where accurate information about shipments and orders can be instantly obtained and constantly checked.

Under the new system, incoming calls and correspondence requesting information are channeled directly to Customer Service. The staff of this department collects all required information and answers requests promptly. Delivery promises, quotations, etc., are being checked daily to keep customers informed as to the progress of the work.

The new department has already demonstrated its value and effectiveness to customers as well as to other departments of the company.

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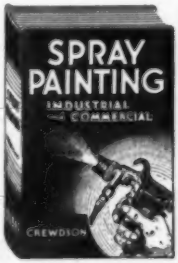

This new book covers the fundamental principles of spraying technique, together with the latest developments and practices of this craft. Covers common paint pigments, paint extenders, enamels, oil and spirit varnishes, shellac, lacquer, synthetics, all types of modern air guns, spraying technique, spraying standard materials, spraying defects, their cause and remedy, flock and suede finishes, striping and lettering, pearl lacquer finish, also automatic spraying, electrostatic spraying, agricultural spraying and automobile spraying. Ends with the sprayers "Ten Commandments."

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Manufacturer of occasional furniture interested in Finishing Foreman who has had quality experience. Must be familiar with the processing of leather tops. Excellent connection for man who qualifies. Salary commensurate with ability. Address IF-584, care Industrial Finishing.

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High-grade wood furniture factory established fifty years in mid-west town of 35,000. Experienced in matching special colors. Starting pay $350.00 per month. Give references to whom we can write. We will pay travel expenses preliminary interview. Address IF-568, care Industrial Finishing.

FINISHING FOREMAN WANTED.

Premanent position, high-grade console radio plant located in Middle west 35 years. Require experienced, quality, production and cost minded finishing foreman with experienced background. Top salary and moving expenses to qualified man. State all particulars in first letter. Address IF-590, care Industrial Finishing.

LACQUER FOREMAN WANTED

We need a man who is a good organizer and administrator, and who also has the necessary experience to supervise a department where pearl and other lacquers are applied to jewelry items on a mass-production basis. BRIER MFG. CO., 222 Richmond St., Providence 2, R. I.

SALESMEN WANTED.

Experienced men for lacquers and synthetic coatings to industrial trade in Metropolitan New York and Connecticut. Drawing against commission. Excellent opportunity. Mail resume for consideration. DURALAC CHEMICAL CORP., 84 Lister Ave., Newark 5, N. J.